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ECONOMICAL LEARNING.[1]

By M. W. MEYERHARDT.

Pedagogy in the past has been principally interested in methods of teaching. With the advent of experimental pedagogy, however, attention has shifted from the teacher to the pupil, and *methods of learning* rather than of teaching are now the subject matter of inquiry.

The whole study of the conditions and methods of learning is the immediate outgrowth of memory experiments, where the measuring of memory performance, that is to say, observation under controlled conditions, affords us a more accurate insight into memory function. Such experimental study of memory has been of two kinds.

On the one hand free reproduction, not based upon definite preceding associations, has been investigated, principally by Galton, and Wundt and his students.

On the other hand, and of more immediate import for pedagogy, learning in a narrow sense is made the object of investigation, or in psychological terms, the formation of permanent associations and their effect upon retention is determined. In other words, the effect of learning is examined and measured.

Ebbinghaus (7) is generally acknowledged to be the pioneer in experimental investigations of memory work proper, of learning, and it is principally to him we are indebted for the methods employed, which, although improved in details by G. E. Müller and his assistants (15 and 16), in principle have remained practically unchanged. For a description readers are referred to their publications.

Since then a large number of experimental pedagogical in-

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vestigations of this kind, or connected therewith, have been made. To be sure, the study as yet is in its infancy, which explains the hypothetical character of many of the conclusions. Much, however, has been ascertained which can safely be made use of for practical application in the school. To sift out and résumé these facts is the aim of the present paper.

METHODS OF LEARNING.

Experiment has established the fact that wherever memorizing is left to accidental success, to the uncontrolled, planless efforts of the pupil, much time and energy are wasted; that as a rule the methods employed are psychologically wrong; in a word, that children learn uneconomically.

Learning in the school has primarily for its end a single correct recitation, and after that permanent retention, or retention of the greater part of the acquired material for a certain length of time. Again, word by word reproduction may be required, or retention of general content only may be asked for. Finally, the school sometimes demands the learning and retaining of certain material for temporary use.

When we speak of economical learning, then, there is meant *a method of learning which achieves its particular aim through the expenditure of the least possible amount of time and energy, and by means of a psychologically correct formation of such associations as are useful for assisting reproduction.*

In order to determine just what the conditions of economical learning are, it seems necessary to inquire into the essential nature of methods of learning, and we must examine separately the factors which enter into memory work.

Given the task to memorize a poem, a vocabulary of a foreign language, a list of numbers, syllables, or words, of some length, experience shows that the first step common to most persons consists in the division of the learning material into smaller parts, each one of which is learned separately by means of repetitions, and, finally, the parts are connected by repeated reading of the whole. Few learn by always reading and repeating the whole material from beginning to end, although experimental observation shows that this latter proceeding, which we will call for short "*the whole method*" is psychologically more correct than the former, "*the part method,*" and much more economical. That is, it often leads with less repetitions, in less time, to a first perfect recitation, and what is of more consequence, makes possible a more confident reproduction and more accurate and permanent retention than learning accomplished by the "part method."

In order to observe how sense material ordinarily is learned, *Lottie Steffens* (22), a student with Prof. G. E. Müller at

Göttingen, made the following experiment: For twelve successive days six adults and one nine-year-old boy learned daily, the former two verses of one of Byron's poems, the latter two parts of six lines each of a German poem. All were instructed to learn each verse as quickly as possible, and to read and recite aloud until enabled to execute one errorless recitation. The observer, who had copies of the verses, designated that part which the learner read by a vertical line on the right. If he read two lines twice, two vertical lines on the right indicated that. If next he read four lines, a third vertical line of a length equal to the space occupied by four lines showed this. Thus length and succession of these lines, together with a secondary arrangement for marking lines which were read in part only, indicated the manner of learning.

It was found that all learners showed the following characteristics:

(1) Each learner divides the verse into parts.

(2) Each one repeats the parts already learned, by going back occasionally while learning later parts, either to prevent forgetting them or in order to associate the parts with each other.

(3) Each one repeats the first lines oftener than the last ones. The boy especially used for them a quite disproportionate amount of time.

(4) Difficult parts or words are learned by means of special, separate repetitions.

(5) The end of one part and the beginning of the next are connected by means of special reciting.

(6) Adults generally learn by trying to *recite* that which is partially learned, controlling this by occasionally consulting the text. The boy learned by reading only.

(7) The more difficult the material, the slower is the reading.

There were individual differences, however. Some read the whole verse first, later dividing it into parts. Others at once tried to learn a part. The boy learned most erratically, wasting as much as twenty-one repetitions upon the first two lines, while using only six for the last two, which caused irregular, hesitating recitation and superficial retention of the last part.

What are the motives, one might ask, for this common way of learning, which, as later will be seen, is so incorrect and so unpractical?

The following explanations are suggested:

(1) Attempting to learn difficult parts separately, we piece up the whole.

(2) Our natural laziness. We seem to be making better progress by learning small parts. We are diffident as to our ability to learn the whole at once.

(3) Æsthetic feeling, irksomeness, curiosity, or interest in content, frequently counterbalance utilitarian motives.

Steffens further showed that where the same persons learned a certain number of verses of a poem by "the part method," and an equal number of the same poem by "the whole method," the employment of the latter method involved a saving of time.

While the average time required for learning a verse by "the part method" was 3 min. 3.3 seconds, it was for "the whole method" 2 min. 47.4 sec., a difference of 15.9 sec. in favor of the latter.

Two learners who had shown a tendency to read the whole verse only after having several times repeated the first few lines, were instructed to learn by "the whole method." While the time for learning a verse by the old method averaged 6 min. 2.7 sec., the average for "the whole method" was 5 min. 40.8 sec., an advantage of 19.8 sec. in the latter's favor.

Two others who had been accustomed to divide each verse into equal parts and to memorize each half separately, were induced to learn by "the whole method." Their average time for the former method was 4 min. 6.1 sec., for "the whole method" 3 min. 2.5 sec., an average gain of 1 min. 3.6 sec.

Experiments with children showed similar advantages in favor of "the whole method." When nonsense syllables (up to lines of 20) were substituted for the sense material this difference in value showed less distinct, but still quite noticeably in favor of "the whole method."

The following considerations may serve for partially explaining this astonishing advantage of learning a material "as a whole" over that of learning it by parts:

(1) In learning by "the part method" the connections between the various parts must be learned separately, work, which in learning by "the whole method," is eliminated.

(2) In learning by "the part method" we associate the end of each part with its own beginning instead of with that of the next following section. These wrong associations later on disturb recitation and therefore must be artificially repressed; that is to say, they must be unlearned by memorizing with special care the transitions to succeeding parts, whereby correct associations are formed.

(3) In learning a material, not only the immediately following parts are associated, but more distant parts also aid each other by so-called mediate association, and again, we fix certain parts more firmly by localizing them, by noting their particular position in the whole. In learning by "the whole method" all these aids are utilized with each reading, while in learning by "the part method" the opportunity for taking advantage of them is almost entirely lost.

(4) In learning by "the whole method" all parts are more uniformly associated; for we are saved from devoting too many or too few repetitions upon respectively easy or particularly difficult passages or parts.

Not quite so pronounced advantages in favor of "the whole method" are shown in experiments by P. Ephrussi (9) at Göttingen, which were conducted, however, upon a somewhat different plan.

In the school as well as in life it is often necessary to memorize material the components of which must be associated by pairs. In learning the vocabulary of a foreign language, for instance, where the foreign words are to be associated with the corresponding ones of the mother tongue, or when the names of cities with their respective number of inhabitants, or historical events with the dates of their occurrence are to be memorized,—in all such cases two methods of learning are possible. The material can be learned as a whole, that is to say by reading and rereading the vocabulary, data, etc., always from beginning to end, or one can proceed to read and repeat each single pair until committed to memory, before taking up the next pair. This may be called learning by the "*cumulative method*" and would correspond to what previously has been called learning by "the part method."

Here again the question arises, by which method do we more quickly, with a smaller number of repetitions, attain our purpose, which in this instance, however, is not a perfect recitation, but retention of the associated pairs. In other words, given one of the two components to be associated, the other must be named.

Like Steffens, Ephrussi took "time required" for his scale of measurement, principally, perhaps, because it is best adapted to quantitative determination.

Twenty-four persons, consisting of 15 gentlemen and 6 ladies, all university students, and 3 girls 13, 15 and 16 years old, of a more or less perfect common school education, participated in his experiments, which extended over from 8 to 36 days, one hour daily being used.

As a first experiment 25 pairs of nonsense syllables were learned, as much as possible without secondary memory aids, that is by what is commonly called mere mechanical memorizing. This experiment furnished the following conclusion:

"With normal concentration of attention "the cumulative method" is more advantageous. When attention is defective, however, "the cumulative method" loses its advantage and sometimes even is inferior to "the whole method."

In another experiment word pairs of Russian-German vocabulary, which one may call sense-creating material, were mem-

orized. Among the subjects were two young girls who never before had studied a foreign language. Here again "the part method" with its cumulative repetitions gave better results than "the whole method," although its advantage was less apparent than where nonsense material was used.

In a third experiment, on the other hand, where a mixed material was used, each pair being composed of a German word of two syllables and a number of three figures, learning by "the whole method" proved a decided advantage.

These discrepancies, according to Ephrussi, are to be explained as follows:

The learning process embraces two psychic processes, (1) familiarizing oneself with each part of the material, and (2) association of the parts. Formation of associations between the parts of the memory material begins in reality only when the material is a familiar one, or has reached a certain degree of familiarity. That particular method, then, is apt to prove more expedient, which produces this familiarity with the smallest number of repetitions. Wherever, on the other hand, the material is to begin with a familiar one, the economic value of a method is apt to be determined by factors which in unfamiliar material play more of a secondary part, for instance, by the degree of stimulation of attention through the manner of presenting the material.

For the advantage of "the cumulative method" in learning a vocabulary he advances the reason that in learning by that method, where each pair is repeated say 5 times, the second component of each pair besides being read 5 times *after* the first, at the same time is read 4 times *before* the first, thus establishing firmer association between the pairs than in learning by "the whole method," where this advantage is lost.

One might here remark that the same ought to hold true for learning a combination material, and perhaps even to a greater degree, because both components of the pair are of the familiar kind. As borne out by his experiments, however, this is not the case, "the whole method" showing here a decided advantage. We must suppose, then, that other factors enter which have a bearing on this question. The discussion of these, however, must be for the present deferred.

In the meantime we may summarize the conclusions drawn from Ephrussi's experiments as follows:

(1) The more familiar the material, the easier is association.

(2) In learning by pairs two kinds of association must be considered (a) association of the first with the second part, (b) the reverse, which leads, when the second part is given, to a reproduction of the first.

(3) Of two otherwise equivalent methods that one is more

expedient which with less repetitions leads to a greater degree of familiarity.

(4) In learning unfamiliar material "the part method," with its cumulative repetition of the pairs, seems preferable, provided, however, that the repetitions for each pair are not so numerous as to cause an involuntary relaxation of attention.

(5) In learning material which is familiar, "the whole method" gives better results.

In Steffens' and Ephrussi's experiments, it will be noticed, it was the time required for learning which determined the economical value of a method. Expenditure of energy and permanency and accuracy of retention were not considered. It is obvious, however, that these must be reckoned as factors which play an equal, if not more important, part in economy of learning. Our analysis, therefore, would be incomplete unless we reviewed experiments by Professor Meumann and his assistants at Zurich (8, 13, 19), whose investigations are perhaps the most comprehensive of all. Professor Meumann set himself the task to answer by experiment the following questions:

(1) By which method do we attain more quickly, with fewer repetitions, a first perfect reproduction?

(2) Which method is most conducive to a uniform distribution of attention upon the memory material and to the formation of correct associations?

(3) Which method leads to more confident reproduction and to more accurate and permanent retention?

In one experiment five school children, 2 girls and 3 boys, 8, 10, 11, 12 and 14 years old took part. The question to be answered was: "Is it more economical to divide a material into few or numerous parts?" For instance in learning a poem of 4 verses, is it more expedient to learn each verse as a whole or to divide it into smaller parts? The experiment proved that *the greater the number of parts* into which the material is divided, *the less economical* is the method of learning. The nearer we approach learning by "the whole method," the quicker and better we succeed. Experiments with adults further showed that the more *voluminous* the material the greater is the advantage of learning by "the whole method." In learning nonsense material, however, this does not manifest itself as clearly as where sense material is memorized. It is here that the difference in value of the two methods becomes more discernible. Let me quote a few examples. Miss K. learned each day for 10 days 2 verses of Schiller's *Dido*, using on the 1st, 3d, 5th, 7th and 9th day "the part method," on the remaining days "the whole method."

It was found that on an average the verses were learned by "the whole method" with a saving of 14.5 minutes, which in

view of the size of the material, 2 verses of a poem, is considerable. Moreover, as later experiments proved, the verses learned by "the whole method" were longer retained and were recited with more confidence. As to repetitions, the highest number for learning 2 verses by "the part method" was 33, while in learning "by the whole method" never more than 14, *i. e.* less than one-half were required.

Finally, it was also ascertained that verses originally learned by "the whole method" required less time for relearning than all others.

The material for another subject, Mr. K., was more voluminous. He learned 5 verses of 8 lines each by "the part method" and an equal material by "the whole method." For the first he required 45 repetitions, for the second only 12, but the time used for learning was in both cases approximately the same: about 32 minutes.

It would seem, then, that the advantage of learning by "the whole method" does not always rest, as Steffens showed, in the saving of time, but chiefly rather in the smaller number of repetitions, the psychologically more correct formation of associations, and better retention. The gain of time, it was found, was not so pronounced, because most subjects, when learning by "the whole method," instinctively read slower than when piecing up the material. They read with more stress, and difficult passages especially were read slowly and with highest possible concentration of attention.

Let us here stop an instant in order to compare the two methods in regard to the psychic processes which come into play, more particularly in regard to attention and the formation of associations.

(1) In learning by "the whole method" firmness of association between the single parts is more even, because the repetitions have been more uniformly distributed.

(2) Associations have been formed in that direction only in which they will aid future reproduction.

(3) Association of the parts with reference to their particular position in the whole has been primarily correctly formed, and is with each reading reinforced, a fact which aids reproduction.

(4) In sense material, content and logical connection aid the formation of associations more effectively when learning is by "the whole method."

On the one hand the content of the whole is easier apprehended when read as a whole, on the other, the content of each part also becomes clearer when apprehended as a part of the whole.

Now the aid which content affords in learning is often so great as to counterbalance 9/10 of the efforts of mechanical

learning. By piecing up the material, therefore, we disturb the efficacy of one of the most powerful levers of memory.

(5) In learning by "the whole method," attention is riveted upon the content, and remains in more uniform tension, thus preventing mechanical learning and mere motor recitation, which are useless for memory. It is this fact mainly which explains the need of fewer repetitions, each one being utilized to the fullest extent.

In our previous discussions all conclusions were based, almost exclusively, upon the results of experiments with adults. Our particular task, however, is to determine whether these differences in the value of methods of learning hold likewise for the memory of the child.

Not to anticipate, it may suffice for the present to state that not in all points is this the case. Nor is it on consideration to be expected. Experiment has demonstrated that the general opinion, shared by pedagogues and psychologists alike, that the memory of children, and more especially the mechanical memory, is superior to that of adults, is erroneous.

Bolton (3), by his experiments with school children under 14, proved that the development of their memory depended upon age rather than general intelligence. That is to say, at a given age, even the most intelligent child's memory capacity is confined within certain definite limits, and that of older pupils is on the average greater, purely by virtue of their age.

This alone would justify the assumption that adults should exhibit greater memory capacity than children up to 14 years of age.

Alexander Netschajeff, of the University of St. Petersburg (17), made similar extensive experiments for the purpose of observing the development of memory in school children.

687 pupils from 9 to 18 years of age were examined by classes. Having been given a series of 12 sense impressions, they were supposed to write down regardless of succession as many as they could remember.

(1) They were silently shown 12 objects: newspaper, key, book, etc.

(2) They heard 12 inarticulate sounds: knocking on wood, tearing of silk, etc.

(3) 12 numbers over 10 and below 100 were read.

(4) Twelve words of 3 syllables expressing visual conceptions were read: wagon, in Russian *Koláska;* lead pencil, *Karandásch;* scissors, *nôschnizi*, etc.

(5) 12 words of 3 syllables calling up auditory concepts were read: *ɣytschánje* to grunt, *mytschanje* to roar, etc.

(6) 12 words were read expressing temperature and touch sensations.

(7) 12 words were read suggesting affective states.

(8) 12 abstract terms like *déjstwie* effect, *prosstránstwo* space, etc., were read.

Although the principal aim of these experiments was to determine the influence of the meaning of words upon retention with particular reference to the differences between boys and girls, we can also make use of his figures for our present purpose.

They show: (1) A steady growth of memory capacity with age, except during the period of puberty, when it is somewhat arrested.

(2) The meaning of words exerts a great influence upon retention.

(3) The memory for numbers showed the smallest relative growth.

While, for instance, the average number of objects remembered by 9-year-old pupils was 6.4, that of 18-year-old pupils was 9.7, a difference of 3.3.

The average retention of words denoting an affective state, was for 9-year-olds 3, for 18-year-olds 6.3, a difference of 3.3.

On the other hand, the average of numbers remembered was 4.4 for 9-year-old pupils, for 18-year-olds 5.3, a difference of only 0.9.

While in general, then, 18-year-old pupils are superior, in remembering numbers, which involves mere mechanical memory, the 9-year-olds apparently are nearly, if not quite, their equals.

Common observation also shows that adults experience often great difficulties in mechanical memorizing, while children accomplish the same with comparative ease. Nevertheless, let that not deceive any one; for it does not prove what it seems to. We know that all our faculties are dependent upon continuous exercise. Now it is the fact that adults are accustomed almost exclusively to sensible memorizing, to retention of the general content, which is apt to account for their inferior mechanical memory performances, not the loss of that faculty. Adults, as experiments by Professor Meumann show, can enhance their capacity so as to learn 3 or 4 times as much as a child in any given time. He found that in learning lines of from 16 to 24 nonsense syllables, adults after brief practice became greatly superior to children under 14 years of age. Younger children are handicapped by the fact that they become easily fatigued. It is utterly beyond the capacity of 8-year-old children, Professor Meumann observed, to learn a line of 16 syllables during one session, even when reading till exhausted, while adults learn lines of 24 syllables without noticeable fatigue. Moreover, it is not only lack of exercise which impairs the mechanical memory of adults, but the direction of in-

terest and attention which are focused habitually upon the content. When obliged, therefore, to memorize mechanically, they find it difficult to readjust attention.

Professor Meumann holds that it is the small capacity of child-memory which partially explains the results of experiments with various methods of learning. It was found that in mechanical memorizing, children, to begin with, succeed better when learning by "the part method." This grows out of the fact that learning by "the whole method" at first renders them ill-humored and discouraged, because they seem to be making no visible progress. Experience, however, shows that in the mental work of children, particularly of younger ones, their disposition, their mood, is of great consequence. This is not conquered, as in the case of adults, by increased effort, but they easily succumb to the paralyzing influence of depressing emotional states. The old adage "nothing succeeds like success" truly holds here if anywhere; for the knowledge of being able to master a problem is a powerful stimulant and important factor in their work. Hence their apparent success when learning by "the part method." But this is quickly changed when, convinced of their error, their sceptical attitude is once abandoned. Then, with but little practice, it was found, children, like adults, learn quicker, with less repetitions and better retention when learning by "the whole method."

A boy 8 years old, for instance, learned verses of Goethe's Erlkönig by "the part method" with 17 repetitions, by "the whole method" with 11. Another verse, divided into two parts, required 15 repetitions; the next, learned as a whole, only 10. About the same ratio obtained in all experiments with school children.

In learning material which forms an unconnected whole, like a vocabulary, dates and the like, Meumann's experiments show likewise that it is of greater advantage to learn by "the whole method." Vocabularies were learned up to 50 word pairs (German, with its corresponding Italian, Russian, Latin or Bulgarian word), alternating in the use of "the whole method" and "the cumulative method." In each case and in every respect, he assures us, the former method proved the more economical. Uniform distribution of repetitions and more even concentration of attention account for this. Attention finds with every step something new; this prevents mere motor recitation towards which children especially incline when learning by "the cumulative method."

These results it will be noticed are at variance with those described by Ephrussi. It must, however, be borne in mind that he only measured the time required for learning, which is but a minor factor in determining the value of a method.

Furthermore, his subjects were extremely sceptical as to their ability to learn by such an unfamiliar method, an attitude which tends greatly to impair success. Finally, in learning a vocabulary, mere mechanical memorizing is involved, to which adults, as a rule, have become unaccustomed. (A former school superintendent of this city reports that pupils of the 7th and 8th grades show greater aptitude for studying German and French than older ones, whose capacity for mechanical memorizing from lack of practice obviously has grown less.) Again, the relative inability of children to concentrate attention is a well-known fact, and it does not seem safe to assume that what holds good for adults will also prove true of the child.

While experiments thus seem to make certain that generally speaking the method of learning "as a whole" is the better, it has nevertheless, as might be easily inferred, its disadvantages. In actual work, one condition of all experiments, namely, homogeneous material presenting equal difficulties throughout is rarely found. Hence, where some parts are especially difficult, all others, although already learned, must be repeated for their sake.

Again, concentration of attention in learning, say a verse of 8 lines, or a line of 16 syllables, is not as uniform as is ordinarily supposed. It rather forms a typical curve, which shows at the beginning and end a relative maximum, in the centre or just beyond a minimum of attention. As a consequence, the middle section is learned last, and is soon entirely forgotten when the whole has not been thoroughly learned.

In learning lines of 16 syllables, for instance, the first and last few are usually remembered first, the 9th or 10th last. Where the line of syllables is very long, two such depressions in the attention curve are apt to appear. In learning by "the part method" these do not occur, because here with each part attention sets in again with a maximum of concentration.

It must be obvious, then, that for practical application the value of "the whole method" might be enhanced and its disadvantages avoided by certain modifications. Meumann proposes two such modified methods which, because they combine the respective advantages of both "the whole" and "the part" methods, while eliminating their disadvantages, he chooses to call "*mediating methods*." The following was found useful for all kinds of memory material: The whole material to be memorized was, with special regard to parts presenting unusual difficulties, divided into several sections, which were marked for the eye by means of a line, or wherever possible by an intervening empty space. In attempting to learn the material, a brief pause was made after each section, but the learner did not, as in learning by "the part method," return to the beginning of that section, but kept on reading to the end. In this

way he memorized by "the whole method" and profited by all its aids, while, on the other hand, the pauses between the sections caused attention to set in again with a maximum of concentration.

Let me give an example: 12 syllables are divided into two groups of 6 each, with a space between them, and while learning them "as a whole" a small pause is inserted between groups. In learning a verse of 8 lines one can proceed similarly, with the difference that here a line is the unit.

A second method, which is employed best in memorizing a vocabulary, consists in learning by "the whole method" until certain word-pairs are found which offer greater difficulties than the average. These are marked off and practiced separately, after which one returns to reciting the material "as a whole" until it is uniformly remembered.

Ebert and Meumann (8), in an extended series of experiments, had occasion to compare the relative value of various methods of learning.

The material consisted for series No. I of 8 groups, each one of which was composed of 4 lines of 12 syllables each; for series No. II, of 4 groups of 4 lines of 12 syllables each. For series No. III the material was made up in a manner which corresponded to series No. I.

Four methods were compared:

(1) "The whole method," where each line was learned as a whole.

(2) "The part method," where each line was divided into two equal parts, each one of which was learned by itself, before the line was read as a whole.

(3) "Mediating method No. I," called for short "the 2x6 method," where the line was learned as a whole, with a pause equal to the time value of one syllable inserted after the sixth syllable.

(4) "Mediating method No. II," or "the 3x4 method," where two such pauses were inserted, after the fourth and eighth syllables respectively.

Each group consisting of 4 lines, a different method was employed for learning each line, so that in each group all four methods were tried, whereby the mediating methods were used alternately at the beginning and the end of a group.

The following chart shows for each of the six subjects, and for each of the four methods, under *a* "the average number of repetitions required for learning a single line," under *b* "the average number of repetitions for relearning a line after 24 hours," under *c* "the average percentage of saving in repetitions, when relearning." Under *A* is given the total average of all subjects for a, b and c respectively. In series No. III only 3 subjects participated.

Series No. I.

Learning material. 8 times 4 lines of 12 syllables each. Averages for 1 line of 12 syllables.

Method.	Mr. B.			Mr. Br.			Mr. F.			Prof. M.			Miss S.			Dr. W.			Total average for all subjects. A		
	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.	Average number of repetitions for learning one single line.	For relearning after 24 hours.	Saving in repetitions. Average percentage for one line.			
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
"Whole meth.,"	14·37	4·5	68.68	13·25	5·75	56·98	11·75	4·25	63·82	20·37	8·12	60·13	18·62	6·5	65·09	14·12	5·75	59·27	15·41	5·81	62·32%
"Part method,"	13·86	5·25	62·12	11·81	6·5	44·03	7·24	4·25	41·29	18·12	7·75	57·22	17·18	8	53·43	18·43	6·62	64·08	14·44	6·39	53·69
"2 x 6 mediat.,"	11	5·25	52·27	13·25	6·5	50·94	10	4·5	55	15·5	8	48·38	18·5	5·5	70·27	15·25	7·5	50·81	13·91	6·2	54·61
"3 x 4 mediat.,"	9·5	4·37	54	11·12	5·5	50·53	8·62	4	53·59	14·25	6·37	55·29	13·75	6·87	50·03	11·75	6·5	44·68	11·49	5·6	51·35

Series No. II. *4 times 4 lines of 12 syllables.*

"Whole meth.,"	7·5	3	60	8	3·75	53·12	6·5	3·25	50	13·5	4·75	64·81	8·25	4	51·51	13	5	61·53	9·45	3·95	56·82
"Part method,"	5·5	2·25	59·09	9·75	4·75	51·28	4·25	2·5	41·17	13·12	5·5	58·07	4·37	3	31·35	8·75	7·5	14·28	7·62	4·25	42·54
"2 x 6 method,"	6	2·5	58·33	8	4·25	46·87	5·75	2·5	56·52	9·25	4·5	51·39	7·5	3·5	53·33	11·75	6	48·93	8·04	3·87	52·56
"3 x 4 method,"	4·25	2·5	41·17	6·05	4	38·46	5·25	3	42·85	9·75	4·5	53·84	6·75	5	55·55	11	6	45·45	7·25	4·16	42·62

Series No. III. *8 times 4 lines of 12 syllables.*

"Whole meth.,"	4·75	2·5	47·36	6·25	4	36	4	2	50										5	2·83	43·4
"Part method,"	2·75	2·25	18·18	8·62	4·5	47·79	2	1·75	12·5										4·45	2·83	36·04
"2 x 6 method,"	5	2	60	6·25	4·5	28	4·75	2	57·89										5·33	2·83	48·63
"3 x 4 method,"	4	2·25	43·75	5·25	2·75	47·61	4	2	50										4·41	2·33	47·12

In series No. I it will be seen, that objectively regarded, it is "mediating method II," or "the 3x4 method," which showed itself most advantageous, the average number of repetitions for learning as well as for relearning being smaller than elsewhere. On the other hand, "the whole method" shows by far the greatest average percentage of saving in relearning. Here, evidently, associations have been more firmly established by the originally greater number of repetitions.

In series No. II the medium average of all four methods combined for learning a single line is 8.09, which again proves the superiority of "mediating method 3x4." The medium average for relearning is 4.05, and the medium average of saving 48.63%.

It is obvious then that, other things being equal, those methods which originally require a greater number of repetitions are the ones which require fewest for relearning. This result is in accord with the fact experimentally established by Otto Lipmann (12): "that a new repetition is of greater value for such associations which at a given previous time were more firmly established."

In series No. III the medium average for learning is 4.79 repetitions, and again it is "the 3x4 method," which surpasses this more than any other. The medium average for relearning is 2.70, which proves that with practice "the 3x4 method" also gives the best results in relearning. Evidently, however, the all around greater skill in mechanical learning, which has been acquired by long continued practice, has a tendency to render the average number of repetitions required so nearly alike, that it does not seem to matter much by what method a line of syllables was originally learned.

Summary.

We can now summarize these experiments on methods as follows:

(1) Each one of the old methods has its characteristic strong and weak points.

(a) The weakness of "the part method" consists in the formation of irrelevant associations, its advantage, in the setting in of attention with full vigor and energy at the beginning of each part.

(b) The weakness of "the whole method" consists in the relaxation of attention, so that the middle part of the material is not so thoroughly learned as the beginning and the end. Its advantage is to be sought for in the formation of associations in that direction only in which they shall be effective in reproduction. Again, it prevents mere motor recitation, which for the process of learning remains relatively or entirely ineffective.

(2) The "mediating" methods combine the advantages of

the "whole" and the "part" methods and avoid their respective disadvantages.

(3) The question "which method of learning is more economical" can be answered from two points of view. A method may be advantageous because it leads quicker to a first errorless recitation,—or, because it effects more accurate and permanent retention and more confident reproduction.

From the first point of view our "3x4 mediating method," where the material is learned as a whole but with two inserted pauses, is the best.

From the second point of view the best method is "the whole method."

(4) "The part method," as far as rapid learning is concerned, stands closer to the "mediating" methods than to "the whole method."

(5) The effect of the methods of learning upon memory work varies in several respects:

(a) The "mediating" methods are conducive to rapid learning and to retention of medium permanency and reliability.

(b) "The part method" effects relatively rapid learning but retention is neither reliable nor does it persist for any great length of time.

(c) "The whole method" requires often more time and repetitions for first learning, but leads to greatest accuracy and permanency of retention and to more confident reproduction.

(6) With long continued exercise in mechanical learning the psychic effects of the various methods approach each other, the learner evidently becoming more and more adept in eliminating the inexpediencies of one method or the other, and in utilizing its advantages.

Individual Differences.

Earlier psychology regarded what Bacon calls "the negative instances" simply as deviations from the average, and often even as errors. With us, however, the most interesting, and frequently the most instructive thing in psychological experiments, is the observation of individual differences. Here an opportunity may present itself to reduce individual abilities to their elementary psychological conditions, and thereby bring us one step nearer to the solution of the problem of human individuality.

In connection with experiments on memorizing, among the many, two fundamental individual differences seem most important,—the difference in the rate of learning, and the difference in the accuracy and permanency of retention.

Experiments show that the difference in the rate of learning is radical, and determines entirely differentiated memory types.

The rapid learner is distinguished not only by the quickness with which he accomplishes his task, that is, arrives at a first errorless recitation, but his whole manner of learning, the effect of learning on retention, his way of relearning, intensity and adaptation of attention, and the course of gradual forgetting differ from that of the slow learner. In a word, each one of these two represents a peculiar memory type, possessing characteristics which are demonstrable in experiments.

The first characteristic, of course, which marks the rapid learner is the fact that he requires less time and fewer repetitions for the production of a first errorless recitation.

For example: Mr. Z. learned a line of 12 syllables with an average of 56 repetitions. Mr. P., who is of approximately equal age, required only 18. After four weeks' practice in learning lines of nonsense syllables Z. required 25 repetitions for learning a line, P only 6.

In learning sense material the types approach each other, because here interest in and special ability for certain material exert an influence; still they remain entirely distinct. In children of approximately equal age similar differences were found. The amount of time expended in learning is naturally proportionate to the number of repetitions required.

On the other hand, the rapid learner also forgets more quickly. With him one errorless recitation does not insure retention for any great length of time. His whole way of learning tends towards temporary rather than permanent retention. In reproducing he recites restlessly and more rapidly than when learning. By means of the after images of sense impressions he effects mere immediate retention, which lasts only as long as the direct after effects of the sense impressions, and disappears with them. As a consequence, while reproducing, he is always alert to make use of anything in his earlier learning which might assist memory, such as pitch, tempo, rhythm, and the like. Just as soon as he feels certain of having learned the material, he is anxious to recite at once, which in fact is necessary, for in some instances it was found that two minutes after learning a line it could no longer be reproduced, and that, after five minutes, forgetting had so far progressed that the learner was no longer able to recognize syllables as having occurred in a line which had been learned. Thus the typically rapid learner as a rule proves likewise the rapid forgetter.

Quite different is the behavior of the slow learner. He requires more time and repetitions for learning, and is not at all anxious to recite at once, but, on the contrary, often asks for some little time, presumably in order to coordinate that which has been learned. He reproduces with great confidence, recites

slower than when learning, and after some minutes still reproduces equally well.

Many other qualities distinguish the two types. The rapid learner is unable to recollect a syllable, when once it has been forgotten, while the slow learner, by forcing memory, usually recovers the missing syllable. The rapid learner depends a great deal upon the first syllable of a line, and in forgetting that, he forgets the whole line. The slow learner is able to begin in the centre, and to reconstruct the line backward and forward. The slow learner abides for a long time by the reading of the material, while the rapid learner soon attempts recitations, controlling these by occasionally consulting the text. The attention of the rapid learner is easily diverted by trifles, which the other does not notice at all. The rapid learner is all excitement, imbued with the one idea to achieve his aim as quickly as possible. The slow learner feels worried only about his ability to succeed without the expenditure of too great an amount of time.

Again the relative gain by practice with the slow learner is usually much greater than with the rapid learner. The above mentioned Mr. Z., during a long continued series of experiments, required at first 56 repetitions for learning a line of syllables, after some months' practice only 19, a gain of about 66 per cent. Mr. P. learned at first with 18 repetitions, later with 8, a gain of less than 56 per cent.

Nevertheless, while the rapid learner, when free reproduction is in question, seems to forget more quickly, it must not be assumed that he is also at a disadvantage when relearning is demanded. Here he is able to utilize most fully the least remaining traces of his former efforts, and therefore shows quite often a greater saving in repetitions.

Finally, in regard to immediate memory, the rapid learner makes a better showing than the slower one. The greatest number of syllables P. could repeat after hearing them once was 8, Z. only 3. A child of the rapid learning type managed to remember 6 syllables, another pupil of the same age only 3.

If asked to explain the causes for these differences in types of learning, we are forced to confess that nothing definite is known. Physical condition seems to have a bearing on the phenomenon. Alexander Netschajeff (17), who examined 130 school children with spirometer and dynamometer, found that of pupils of the same age the stronger ones, on an average, had also the better memory. Practice in learning and general intelligence possibly play a part. As to the principal cause, however, as Meumann points out (13), it must probably be looked for in the fundamental differences of attention in the two types. "It is chiefly the difference in the rate of central

adaptation to the present activity which conditions the different effects of learning," he declares. The rapid learner is able to adjust his attention almost immediately to the particular demands of whatever activities he may be engaged in, and thus he attains quickly his maximal concentration, with the result that his first few repetitions have full value for memory, and no part of his efforts is lost. The learner whose adaptation is slow, on the other hand, reaches his maximum of concentration only gradually, and his first few repetitions are of little value for the purpose of retention. True enough, the rapid learner also loses adaptation more quickly, but that is not of much consequence; for he is able to regain it almost at will. This is seen plainly in the effect of pauses during the act of learning. While short rests are agreeable to both types, long intervals the slow learner avoids from fear of loss of adaptation.

Thus both qualities, rapid and slow adaptation, have their advantages as well as their disadvantages. While one of the former type can readily change from one activity to another, a feat quite difficult for the other, the latter, after not too great pauses, is able to continue his work with uniform energy and concentration, because during the interruption he has not lost his adaptation.

Again, connected in many respects with the learning types, are the so-called image types. As is well known, Charcot, in psychopathological clinics, observed that we think in images, which are the result of impressions by the various organs of sense, and we now distinguish between the predominately visual, auditory, or motor types. As might be expected, the manner of learning is conditioned by, and correlated with, the manner of imaging. The visualizer learns by means of his images of word groups and arrangement of syllables. The auditory and motor types in reading immediately transform the visual into auditory or motor images. Their mode of learning consists in the formation of a number of successive images of sounds or spoken words, or of successive innervations of speech-muscles, accompanied by corresponding movement sensations. As a consequence, in reproduction, they are obliged to run off a line of syllables, either in thought or in words, while with the visualizer retention is simultaneous association. He is able to reproduce a line equally well either forward or backward, a rather difficult task for the other types, whose association is successive.

Unfortunately, the accuracy of retention of the various image types has not been investigated. It would seem, however, that visual memory, while working slower, is the more accurate, and that as a rule it is the visual learner who in reproduction displays a greater degree of certainty.

Finzi (10), in the course of his experiments, found that visual impressions are less subject to falsification than auditory impressions. Müller and Schumann (15) and Müller and Pilzecker (16) made similar observations. Meumann reports (13) that mental calculating is done slower but with far less errors when visual imaging supplements the acoustic-motor images of numbers.

Münsterberg and Bigham (14 *a*), in experiments with numbers and colors, found that with their subjects the average of errors committed by visual memory was about $\frac{1}{5}$, to be exact 20.5 per cent, while that of auditory memory was about $\frac{1}{3}$, or more exactly 31.6 per cent. They further ascertained that when visual and auditory memory come into play simultaneously, the number of errors diminishes considerably. Thus with a subject, whose memory for numbers in the auditory series showed 14.1 per cent. of errors, and in the visual series 10.5 per cent., the percentage of errors descended to 3.9 per cent., when the numbers were at the same time seen and heard.

In all probability, then, one would not be wrong in saying that the two elementary qualifications which characterize the slow learner are slow adaptation of attention and visualizing. A perfect memory, accordingly, must be supposed to be founded on all around developed imaging. If true, this is a pedagogically important fact to which we shall have occasion to refer again.

Further individual differences are revealed by the manner in which various individuals effect primary or immediate retention. Here again typical differences in the whole conduct of learners are found, as well in regard to the behavior of attention as to the memory aids by which primary impressions are retained. To show these most clearly I can do no better than compare the conduct of two of Meumann's subjects named Mr. D. and Mr. F.

The first divergence we find in the nature of their errors when reproducing letters and numbers. F. mostly makes mistakes of position. D. mistakes of sound. That is to say, the former misplaces letters or numbers in a line, while the latter substitutes for certain letters others of similar sound. When the letters or numbers are read, D.'s memory is aided by closer print, a factor which is of no consequence for F. When made to listen with their tongue clasped between the teeth, F. makes more mistakes than D.; the former also is actuated by a strong impulse to draw back the tongue. It would seem, then, that D. obviously retains, by means of acoustic images, F. by means of imaged or actual speech movements.

The chief difference, however, is that of attention. D. directs attention not upon the single letters, nor does he actually

focus the whole line, but he diverts attention so as to take in the whole uniformly, with a mere flash of consciousness. "Immediately after speaking has ceased," he declared, "I have only a weak acoustic total image of what I have heard, which rapidly becomes more distinct, and I then write quickly *as a whole* what I retain." F. describes the behavior of attention as just the reverse. "I direct attention," he says, "upon each single letter, and in writing I connect successively the single parts, giving each its place in the line."

F.'s attention, therefore, is discrete, that is to say, it is directed successively upon the single parts, each one of which is added to the others until the whole is formed. D.'s attention is a kind of total attention, which in reality begins its full work only after the whole line has been spoken. D.'s attention works analytically, F.'s synthetically.

Here, then, it would seem, we have to do with an inner connection between the memory aids of these two individuals and the behavior of their attention. It is F.'s motor way of retaining, making it necessary for him to accompany each letter with separate speech innervations, which directs his attention upon each single part of the line, while for D.'s acoustic way it is of greater advantage first to allow the single parts to melt into "a whole," in order to reproduce only that. We are justified in this assumption by the well-known behavior of attention in other mental activities, in reading, for instance, where some focus the single parts of a word, others as large a reading field as possible. We speak there of fixating or fluctuating attention.

When we approach the field of learning aided by content, conditions become more complicated as the result of a vast number of possibilities which grow out of the nature of the sense material and its effect upon the learner. The material may be on the one hand of a more perceptive or a more notional character, on the other, it may be logically more or less abstract. Again, its meaning may be simple and clear, or complicated and obscure. Grammatical construction, length of periods, alliteration, rhythm, and many similar factors are of consequence for memory. In view of the many problems growing out of these conditions, the facts which so far have been ascertained seem rather insignificant, still they are pedagogically important.

Experiments here again have brought to light the existence of typical individual differences in rational memorizing. One class of learners pays attention almost exclusively to content and logical connection, and remembers the words only in regard to the way in which they give expression to these.

In learning a poem, for instance, they depend upon as clear

as possible a realization of the events, actions, persons or localities described. In learning prose, content is a still greater factor, while in addition grammatical connection of periods is noticed. Rhythm, rhyme, length of words and periods assume the character of mere secondary memory aids. With others, however, the sensory elements of the material play the principal rôle. They observe in the first place the optic elements, length of words and periods and their location in the material. Or else the acoustic elements, like pitch and rhythm of their own voice, alliteration, phonetic difficulties, and the succession of motor innervations in speaking. Here content is of secondary importance.

A third typical difference consists in the fact that some learners attempt to fix the whole material "as a whole." In learning a poem, for instance, the single lines or periods are learned only as parts of the verse, the single verses only as parts of the poem, and attention is focused upon this total connection of the content. Others, on the contrary, arrange the single parts contiguously and then join them to the whole. Their attention is synthetic, that of the former analytic.

As a fourth variety, although not of fundamental import, may be mentioned what Ephrussi (9) styles the "ingenious type." They show a tendency to learn by the aid of all possible secondary, self-constructed ancillary associations, which others dispense with altogether. A majority of these secondary resources, however, disappear in the course of a long continued series of experiments, especially when the learner makes an effort to avoid them; and they are the result of habit rather, it would seem, than of differences in memory organization.

A comparison between the memory performance of school children and that of adults indicates that the immediate memory of the former is much inferior. If we array the results of experiments with school children by Binet and Henri (2) against those with adults by Professor Meumann (8), we find that the accomplishments of children from 10 to 12 years old average about ⅓ or ¼ of those of the skilled adult. While adults sometimes remember 13 or 14 letters or numbers, 8 or 9 syllables, 12 words, 24 words of a verse, and as much as 36 words in prose, pupils 11 and 12 years old rarely are able to reproduce correctly more than from 3 to 5 impressions.

Practice, of course, may have enhanced the ability of these adults to a point beyond the average, and again the individual performances of children of equal age often differ greatly. Some of the more gifted retain nearly twice as much as others. On the whole, however, there is hardly room for doubt that the primary memory of the average pupil is little developed, which

reminds one that the old school maxim that "questions by the teacher should be brief," is psychologically well founded.

Secondary Conditions of Learning.

According to Ebbinghaus (7), the manner in which repetitions are distributed is of great consequence for economy of learning. He found that by distributing the repetitions over a more extended period of time, it is possible to learn lines of nonsense syllables with a smaller number of repetitions. While, for instance, the learning of a line of 12 syllables required 68 repetitions, which immediately followed one another, 38 repetitions distributed over three days produced the same effect.

In agreement herewith stand the results of investigations by Ad. Jost (11), a student with G. E. Müller, who found that associations are stronger when formed by repetitions distributed, with 24 hour intervals, over several days. A line of syllables, for example, learned with 30 cumulative repetitions, was not as well retained as a similar line which had been learned by repeating it 10 times each day for three successive days.

Jost further found that the more extended this distribution of repetitions, that is to say, the longer the period of time over which they are distributed the greater is the advantage for learning. He therefore formulates the law that "where two associations are of equal strength but of different age, a new repetition is of greater value for the older of the two." Experiments by Müller and Pilzecker (16) and Otto Lipmann (12), on the whole, have verified his results.

The significance of Jost's law is apt to become most apparent in learning voluminous material, where by distributing the repetitions we work in part with relatively older associations, while in forcing learning by cumulative repetitions all associations are relatively alike new.

Ebbinghaus (7) adroitly points out that the instinctive behavior of teacher and pupil have foreshadowed the findings of experiment. "The pupil," he writes, "in learning a vocabulary or rules, does not usually force memory by trying to learn them at once in the evening; he knows that it is necessary for him to go over them again in the morning. A teacher likewise will arrange his course by distributing the lessons, not uniformly over the whole time which is at his disposal, but he reserves a part beforehand for one or several recapitulations."

A number of questions which have a bearing on economy of learning can be answered only apparently with reference to the image types.

First the question "whether it is easier to learn material which is heard than that which is read." The predominately

visual type, it would seem, learns better by reading only, the auditory type by means of spoken words. Meumann (13) reports of two of his subjects who retained predominately by means of acoustic images that they obtained better results when concentrating attention only upon these. Reading, in their case, exerted a disturbing influence, and when obliged to learn by reading only, attention being divided by the visual and acoustic images, they seemed to falter, for a time at least, between the two directions of attention. As a consequence learning became more difficult.

Closely connected with the former is the question: Is it more advantageous to learn aloud, half-aloud, silently or with repressed voice? Experiments by Meumann and Pentschew (19) seem to indicate that, generally speaking, for adults half-aloud learning is more favorable, for children silent learning or that with repressed voice. An explanation of the latter phenomenon is probably to be sought for in the fact that children oftener than adults belong to the predominately visual motor type.

Müller and Pilzecker (16) found in the course of their experiments that certain letters by their quality or position in a syllable tend to attract attention in a greater degree than others; that the former are remembered while the latter are forgotten. Pathologists also relate cases of aphasia where only the first letter of a word, or the first few letters were remembered. Again, that in words reproduced by patients in a very mutilated form, the vowels only; and in their right order, were frequently correctly repeated.[1]

Ziehen (25) observed that some individuals memorize the vowels quicker than the consonants, but that occasionally the reverse is the case.

These phenomena, again, must probably be explained by the difference of image types. Although not definitely established, it seems that consonants are better remembered by the visual type, vowels by the auditory type, while sounds presenting peculiar motor difficulties of pronunciation, in consequence of the longer time and greater stress which they require in learning, are apt to be better remembered by the motor type.

A further question of interest is the effect of rhythm upon learning. It can be briefly answered by saying that it is extremely unprofitable to learn without rhythm. Experiments tend to show that with some individuals the suppression of rhythmic speaking makes learning all but impossible. When continuously repeating a material we lapse involuntarily into a form of rhythmic speaking, and this is of advantage for learning. Whether one metre or the other is preferable we do not

[1] C. Moeli: Berliner. Klin. Wochenschrift, 1891. No. 49, p. 1167.

know, some liking the trochee, others the iambic. There are reasons to suppose, however (15), that as a rule that measure is most advantageous to the learner which in consequence of its frequent occurrence in the mother tongue is most familiar to him. Pentschew (19), in experiments with *German* school-children, on the other hand, found that with one exception the iambic (and not the trochee, as one might expect) was preferred.

Last, but not least in importance, is the influence which the rate of speaking or reading exerts upon learning. Experiments show that this greatly affects the despatch with which the learner reaches his goal. According to Ebbinghaus (7), the quickest possible rate is the most profitable. He found in learning lines of unconnected words and part of a poem, that a rate of 200 iambics per minute or 0.3 seconds for each measure is the most advantageous for him. He also found, when relearning the same lines 24 hours later, that those lines had been better retained which originally were learned with greater speed.

Quantz (20) reports as an incidental result of his experiments that usually those subjects remembered the most who in learning read most rapidly. Ogden (18), however, was unable to verify this result. In his opinion the number of repetitions increases with the greater speed, to such a degree that it makes learning in this way unprofitable. Whitehead (24) advocates as a happy medium between rush and hurry on the one hand and drag and tedium on the other, a rate corresponding to the beating of the pulse, but he omits quantitatively to demonstrate that as the most favorable rate. Prof. Meumann (13) holds that generally speaking neither the slow nor the rapid rate is the more profitable. "The one thing of importance," he writes, "is the adjustment of the rate of learning to familiarity with the material and to the progress of the memory work."

Thus opinions are well divided, and much can be said on either side of the question. Theoretically one would incline to the belief that firmness of association is apt to be enhanced by a growing rate of speed. For, without mentioning the well-known influence of time intervals upon strength of association, experiments on association in mediate succession also show that firmness of association diminishes correspondingly as the time-distance between its elements increases. On the other hand experiments on the forgetting of primary impressions have established the now well-known fact that recollection of these is most accurate not immediately after the sense stimulus has ceased, but about 1½ or 2 seconds later. Consciousness requires a certain time for working up an impression, and again the sense organ, the eye or ear, must regain its most favorable

condition for receiving a second impression. Steffens (22), it will be remembered, observed that in learning sense material her subjects adopted instinctively a slower rate when endeavoring to memorize something more intensively. Again, Cattell, in experiments performed with a view to ascertain the rapidity of thought, found that although very familiar with German he takes 1/7 second longer to name an object in that language than in English. He takes ¼ second to translate a word from German into English and 1/20 second longer to translate in the reverse direction.

On consideration, then, Meumann's position seems well taken. When we approach unfamiliar material it is naturally disadvantageous to skim over it with eye and attention as rapidly as possible. In doing so we waste a number of repetitions upon mere reception of optic-acoustic impressions, and some more in order to understand at all the content of what is to be learned. We get the best results by reading at first slowly and attentively, accelerating the rate later on. His experiments of learning lines of syllables from a rotating drum, the speed of which was controlled by the learner, show that the rate at first is very slow, much slower than when the rate was regulated by the experimenter. Then, with periodical fluctuations, the rate gradually increased until towards the end of learning it attained an enormous rapidity, which barely permitted hasty reading. This evidently proves that the rate of learning is adjusted to the progress in memorizing.

It is just as wrong, therefore, to read uniformly slowly as to read always as rapidly as possible. In following the former course, attention, as learning progresses, is not sufficiently occupied; it deviates; the learner becomes restless, impatient, and ill-humored, which cannot fail of exerting an unfavorable influence upon learning.

To recapitulate briefly, we have found that the principal points which represent the most favorable conditions of learning are as follows:

(1) Learning by means of "the whole method" for greatest accuracy and permanency of retention, or by means of a so-called "mediating method," as one which on the average is the most economical.

(2) Learning with adults accompanied by half-aloud speaking, with children by speaking in repressed voice, with visualizers by no speaking.

(3) Learning with rhythmic speaking.

(4) Learning which utilizes most fully those memory aids peculiar to an image type.

(5) Learning which in voluminous material judiciously distributes the repetitions.

(6) Learning which adjusts the rate of reading and speaking to the progress of the memory work.

Memory Work in the School.

The fact which more than any other impresses the student of memory experiments with school children is undoubtedly the great disparity between labor and gain which characterizes their memory work. Experiment not only has ascertained that pupils show a peculiar tendency to learn uneconomically, but that quantitatively, as well as qualitatively, their memory is but little developed, and naturally there arise the questions: (1) By what means can learning be put systematically upon a higher plane and (2) to what extent, and how most effectively can the school enhance the memory capacity of the child?

If nothing more, these experimental results have served to convince us that learning is not the relatively simple process it is ordinarily believed to be. Memory is a faculty infinitely complex. That of our neighbor's is not like ours. Indeed, it seems quite safe to assert that probably no two individuals have identically the same memory. For all that, it is the common practice of the school to demand of all pupils, without reference to mental preparation, the committing to memory of relatively difficult material, and to the unsuccessful the teacher's only advice is apt to be: "Try again." Thus to leave memorizing to the uncontrolled efforts, the planless, fumbling attempts of the child, means nothing less than inviting a waste of time and energy, and sometimes even courting total failure.

The first demand, therefore, to be made of the school, towards which the results of experimental investigations seem to point, is that of instruction in learning in accordance with psychological rules. That is to say, the activities of the pupil should be made to conform to what research has established as the conditions of *economical learning*. Such instruction could be theoretical and possibly also practical; the former consisting of acquainting the pupil gradually, as he grows older at greater detail, with the conditions and methods of economic learning, with particular reference to individual differences; the latter of systematic memory exercises in conjunction with the regular memory work of the school, but with practice for its own sake as the principal aim.

Should we attempt to answer the question, "how can this be done?" our present inadequate knowledge, of course, would preclude the possibility of establishing a set of hard and fast rules, and we must confine ourselves to tentative suggestions, some general directions which remain to be worked out in detail.

First, concerning theoretical instruction, two points would

have to be touched upon. On the one hand, the pupil must be acquainted with those methods of learning whose employment generally is productive of the greatest advantage, and on the other, his attention must be called to the general memory aids and to the idiosyncrasies of the various types.

The teacher could (1) determine individually the characteristics of his pupils by examining a few each day.

(2) Call the attention of each pupil to his own characteristic way of learning, and

(3) Show how to employ that method most advantageously, or pointing out its disadvantages, indicate how to improve it.

Such a demand, to be sure, presupposes on the part of the teacher an acquaintance with the methods by means of which the individual memory type of the pupil may be determined. These, however, need not at all be intricate. A simple proceeding like the following, for instance, may serve to give some preliminary information.

In order to determine whether a pupil retains better letters or numbers which he sees, or those which he hears, 25 letters or numbers divided into 5 lines of 5 each are arranged uniformly into a square, divided into 25 equal squares, and he is told to memorize these in the usual way from the left to the right. On being able to recite them without error, he is asked to recite those letters or numbers which from the left to the right form a diagonal line, or again, those contained within a vertical line of squares. Either one of these tasks would be relatively easy for the visualizer, who sees in his imagination a table such as has been shown him in reality. He will require for reciting these lines little more time than for the first. Not so the one who belongs to the auditory type. In his imagination exists no table which he can read. He hears an inner voice repeat to him the series of letters or numbers, but this is localized not in space, but in time. In order to find the second letter of the second line, for instance, it is necessary for him to count seven; in order to find the third of the third line he must count thirteen, and so on. All that, however, requires considerable time, much more time than for the visualizer who accomplishes such tasks quite rapidly and with relative ease.

A somewhat more complicated test, but one which is also more reliable, is the following: A number of phrases, words or syllables, sufficient to fill a certain given length of time, is presented first to the visual, next to the auditory memory, and it is then ascertained of which series the greater number has been retained. In the first series, for instance, during one hundred seconds, fifty words, one every two seconds, are exposed to the eye of the pupil, in a second series fifty words of a similar nature, one every two seconds, are spoken with a

loud voice. If of the first series a pupil retains say 25, of the second only 15 impressions, auditory memory has proved itself inferior to visual memory.

Care, however, should be taken not to place too much reliance upon a solitary test. Even under most favorable conditions the results of such rough tests are far from conclusive. And if we consider that various causes, such as general fatigue, or temporary fatigue of the eye or ear, interest in the meaning of words, defective attention, etc., greatly impair the accuracy of the values, it must be obvious that only repeated tests will enable us to determine with any degree of certainty the image type.

Having next ascertained the attention type of a pupil in regard to the previously developed fundamental differences, the teacher is now in a position to call the attention of the pupil to the peculiarities of his mode of learning, enlighten him in regard to its advantages or disadvantages, and instruct him how to improve it. According to Meumann's (13) observations, such tests and instruction are both interesting and useful.

The pupils by gaining a certain insight into the mechanism of learning get more enjoyment out of the formal act of learning. The teacher acquaints himself with the causes of the success or failure of their memory work. He discovers the particularly strong or weak points of individual pupils. He observes that the attention of the one adjusts itself with difficulty to the material or to the activity of learning, that of another with relative ease; that this pupil shows a tendency to memorize preferably by the aid of the sense elements, that one rather by paying attention to content; that "one" works with more perceptive representation of the material, "another" by apprehending logical connection. He notices that some learn by joining the parts to a whole, others by regarding each part only in its relation to the whole; that here, attention is characterized by intensity of concentration and fixating progression, there, by extension and fluctuation; that to one the acoustic elements offer the greatest aid, to others, the visual or motor elements or combinations of these.

In connection herewith, however, arises a mooted question among psychologists, namely, "whether it is better to encourage pupils to make use of as many memory aids as possible, or to work only with those which are best adapted to their own peculiar type." Experiments by Bigham, mentioned above, seem to speak for the former. Theoretically, also, one could argue: "The greater the number of associative connections, the more assistance for retention and reproduction."

Nevertheless, Meumann's experiments do not seem to bear this out. He found that individuals unskilled in learning suc-

ceed better when working only with those aids to which they are accustomed. The unskilled of the acoustic type, for instance, retained better when the acoustic associations were not weakened by the subjects being told also to mind the visual images.

Furthermore, the fact that individuals unskilled in learning nonsense syllables, at first require an often quite ridiculously high number of repetitions, as much as 60 or 70, for learning a line of 12 syllables, while on the following day only ½ or ⅓ of that number are required, and later on only as few as 2 or 3 repetitions, also seems to indicate that the learner at first, hesitating between various modes of learning, wastes the greater part of his efforts, that he succeeds better after having found those memory aids which are best adapted to his own peculiar type, and lastly, that it is the skilled learner only who is able to use profitably aids uncommon to his type.

Hence, Meumann's proposition that at first children should be taught how to use properly their innate memory aids, and only when more skilled should they attempt to enhance their memory performance by gradually remedying the deficiencies of their mnemonic faculty.

A second point at issue is the question "how do rational and mechanical memorizing cooperate?"

The school rightfully insists that the former is to be preferred.

Our memory, we know, does not retain a multitude of impressions seen and heard hundreds of times. This proves that it is not repetition as such which is responsible for learning and retaining, and which makes free reproduction possible, but that, as a rule, we remember only what we have apprehended with attention and with intention of retaining.

Repetitions, then, however necessary for retention, make reproduction most sure only when they are consciously and intentionally for the purpose of acquisition. On the other hand it might be asked, "Is there such a thing as purely rational memorizing, which can dispense with all mechanical elements of mere reciting, and is that the ideal way of learning for children?

Psychological experiments show that for trustiness and permanency of retention, mere apprehension of content does not suffice, and that for permanent acquisition the mechanical element of mere repetition must co-operate. Repetitions, in fact, have the same effect for sense and non-sense material, although for the former a much smaller number is required. Side by side with attention and understanding of content, they have a peculiar independent effect on learning.

Wherever in experiments psychophysical condition, or some cause or the other, prevents a thorough concentration of atten-

tion, and the attempt is made to remedy that defect by multiplying the number of repetitions, it has been found, as our investigation of learning by "the whole method" clearly showed, that just such materials are remembered longest and leave the most persisting traces in memory. And, again where, as it sometimes happens, verse-metre or content being particularly stimulating, attention is intensified, and a pleasurable emotional tone induced, in consequence of which a saving in repetitions occurs, it has been ascertained that retention of this kind of material is not as permanent. For anything, therefore, to become a permanent possession of the mind repetitions are necessary.

Moreover, especially in verbatim memorizing, it would seem, these repetitions must contain a mere mechanical element. The mere retention of ideas or association of ideas does not enable us to recite a poem. It must be supplemented by association of the optic-acoustic-motor elements of the heard and spoken words, which, though secondary in importance, are not a negligible factor in learning. While, therefore, apprehension of content and constant direction of attention upon logical connection should be accentuated, and the pupil, perhaps more than ever before, be guarded from substituting for these the mind-killing, "mechanical" learning of a text, we must ask of the teacher, as another point for theoretical instruction, to advise pupils how to effect cooperation of sensible content with the indispensable mechanical part of learning.

The objects of instruction then, according to their importance, are to be placed in somewhat like the following order:

(1) Attention upon content.

(2) The advantages or disadvantages of the various methods of learning.

(3) The characteristics of the image type to which the learner belongs; the fundamental characteristics of his attention, and the disadvantage of its slow adaptation.

(4) Cooperation of rational and mechanical memorizing.

In advocating the introduction in the school of systematic memory exercises, we meet a number of serious difficulties. In the first place we are apt to encounter the "laisser faire" theorist, who will say: Is not the pupil daily, yes hourly, engaged in exercises with the ultimate object in view of strengthening memory?

This, of course, we cannot deny; but we simply contend that the way in which it is done, is not as effective as it might be. If the method which is usually followed in the schools is a good one, we ought to be able to prove that the memory of those pupils who have followed it longest is much superior to that of

beginners, that is to say, the memory ability of older pupils should be considerably greater than that of younger ones, and the average memory capacity of the higher classes should greatly surpass that of the lower ones.

But is that the case?

In order to answer, let us note the results of experiments made for the purpose of quantitative measurement of the memory performance of school children.

Binet and Henri (2) examined the memory of 380 pupils of primary schools in Paris, ranging in age from 8 to 13 years, in the following manner: Seven words in succession at a rate of one for every half a second were pronounced, and the subjects were asked to repeat immediately as many as they could remember. The number correctly remembered having been noted, another series of seven words was pronounced for the same purpose, and this proceeding was repeated 7 times in all.

The immediate memory was measured by counting all the words correctly reproduced and by dividing this number by 49, while permanent retention was determined by asking the subjects to reproduce all words which they remembered of the total series.

It was found that the number of words immediately remembered varied with age, but that this variation, for subjects of from 7 to 12 years, was remarkably small, being only 3/10 for a line of 7 words. The average number of words remembered was 4.7 correct out of a possible 7. The average number remembered in the 4th class (approximately 8-year-olds) was 4.6; 3d class, 4.9; 2d class, 4.8; 1st class, the oldest pupils, 4.9.

Still more discouraging are the results of experiments by B. Bourdon (4) who examined, from a strictly pedagogical point of view, "the influence of age upon immediate memory." About 100 lyceum pupils, ranging in age from 8 to 20 years, were individually examined, and this is the author's conclusion: The immediate memory remains almost stationary from the 8th until the 20th year. He proposes, however, to distinguish two periods: one, from 8 to 13 years inclusively, during which a slight growth was noticed; the second, from 14 to 20 years, during which no perceptible improvement was found.

Experiments by Bolton and by Jacobs, an English psychologist, on the whole have verified the above results.

We can no longer doubt, then, that generally speaking, development of memory during school life is exceedingly small. Moreover, could one not justly raise a question, how much the training of the school contributes to what little improvement there is, knowing, as we do, that the mere fact of advancing age (at least within certain limits) naturally increases mne-

monic proficiency? If the general psychological and biological assumptions are correct, "that childhood and youth constitute the golden period for laying the foundations of a good memory, because then the neural substance is most plastic," could one not, on the strength of the above figures, come to the conclusion that the present methods of the school are radically wrong, and its efforts woefully misdirected?

Amazing as such assertions may seem, and exaggerated as they doubtless are, nevertheless the experimentally established fact that the immediate memory of adults who years ago have left the school and since then had no occasion to practice memorizing surpasses that of any child, must lead one to think that they are not entirely without a certain element of truth.

A second series of objections against systematic memory exercises grows out of the question: "Is it possible to improve memory and to what extent can this be accomplished?" Certain psychologists, it will be remembered, hold that no amount of culture is capable of modifying general retentiveness, and that all improvement of memory lies in the line of elaborating the associates of each of the several things to be remembered. A man's general retentiveness is a physiological quality, given once for all with his organization, and which he can never hope to change. While they admit that whatever amount of intellectual exercise is bracing to the general tone and nutrition of the brain, will also be profitable to the general retentiveness, they maintain that more than this we cannot say. Accordingly the popular notion that certain exercises systematically repeated will strengthen not only a man's remembrance of the particular facts used in the exercises, but his general faculty of remembering, must be erroneous.

When school boys improve by practice in ease of learning by heart, such improvement will, they are disposed to think, be always found to reside in the mode of study of the particular piece, due to the greater interest, the greater suggestiveness, the generic similarity with other pieces, the more sustained attention, etc., and not at all to any enhancement of the brute retentive power.

Another argument against general memory exercises is somewhat as follows: According to the modern psychological conception of the nature of consciousness, we must distinguish between various special memories. Will exercise of one of these, it is asked, be instrumental in improving other special memories of a given individual? May a composer, for instance, hope to improve his visual memory by strengthening, by means of systematic practice, his acoustic memory? Experiments, it is explained, do not justify us in answering that question in the

affirmative. All we know is that practice in retaining certain impressions aids memory of that particular kind. Even though it may appear that exercising a certain special memory at the same time improves other memory forms, it is probable that such an improvement does not rest upon the exercise of general memory function, but rather upon the incidental acquisition of certain "schematic knacks," a more suitable general conduct, which facilitates learning. In brief, existence of a general memory function is denied, from which follows that general memory exercises are out of the question.

The answer to such objections is, that even though the results of systematic memory exercises were but the acquirement of a more suitable, a more correct conduct on the part of the learner, his efforts would not be entirely lost. For practical pedagogy it is of secondary importance, whether the coexercise of other special memories rests upon one cause or another, upon the existence of a general memory function which is developed, or upon the enhancement of other factors, like attention, interest, etc. It is interested chiefly in the question whether or not a general memory exercise is possible, whether formal memory exercises tend to enhance the memory performance of the child, and only incidentally in the psychological ground upon which such an improvement may rest.

Unfortunately, however, even these questions, for the present at least, cannot be answered with any degree of certainty. About the only experiments to be reported which record a positive result, are some by Ebert and Meumann (8), and these, as Meumann himself acknowledges, are open to certain criticisms, which, though each one in itself may seem insignificant, taken altogether cannot fail of rendering the results less definite than is to be desired. Ebert and Meumann's investigations aimed at a purely objective answer to the question, "whether a general enhancement of memory occurs when one special memory is improved by exercise." Briefly stated, their experiment was as follows: First of all, in a preparatory series of experiments the present ability of all subjects was measured, in regard to immediate as well as to permanent retention. What may be termed "a cross-section" was made through as many special memories as seemed necessary to determine the effect of purely one-sided mechanical exercise upon memory as a whole. Measurement of immediate retention was in regard to (a) nonsense material, comprising letters, numbers and nonsense syllables, (b) sense material, such as logically disconnected words, (c) Italian vocabulary, (d) verses of a poem, and (e) sentences in prose. Permanent retention was measured in regard to (a) lines of nonsense syllables of various lengths, and lines of optical signs, (b) Italian vocabulary, verses of a poem and sentences

in prose. Next these subjects exercised for 36 consecutive days but one special memory form, that of mechanical memorizing of nonsense syllables, when again a cross-section of the previously mentioned special memories was made in order to determine the effect. Having ascertained an improvement, mechanical memory exercise was resumed by some for 18 days, by others for 36 days, and, finally again, all special memories of the subjects were quantitatively examined.

The following are the figures obtained :

Average immediate retention

of	First Cross-section.	Final Cross-section.	Percentage of improvement.
Numbers, ...	7	11.16	59.42
Letters, ...	7.16	11.33	58.24
Nonsense syllables, . . .	5.16	7.33	42.05
Disconnected words, . . .	6.5	8.83	35.84
Vocabulary, ...	5	6.5	30
Words of a poem, ...	15	19	26.66
Words of philosophic prose,	17	22	29.41

Permanent Retention. Average number of repetitions necessary

for		First Cross-section.	Final Cross-section.	Percentage of improvement.
One nonsense syllable, . .	First learning,	2.11	0.48	77.25
	Relearning 24 hours later,	0.49	0.20	59.18
One optical sign, ...	First learning,	3.83	0.90	76.5
	Relearning,	0.68	0.30	55.88
One vocable, ...	First learning,	0.273	0.108	60.43
	Relearning,	0.056	0.036	35.71
One line of a poem, . . .	First learning,	0.75	0.47	37.33
	Relearning,	0.14	0.07	50.0
One printed line of philosophical prose, ...	First learning,	1.45	0.5	65.51
	Relearning,	0.3	10.09	70.0

The results of Ebert and Meumann's experiments show, (1) that the one-sided exercise of one special memory at the same time improved the ability of learning and retaining other memory material of an entirely different nature; or differently expressed, the exercise of one special memory resulted in the co-exercise of other special memories; and (2) that this co-exercise does not occur in a uniform way, but that other special memories are enhanced at a ratio which is determined by their relation in regard to the nature of the material and mode of learning to the special memory exercised.

As to the extent to which memory can be trained, two points must be considered: (1) How far is it possible to enhance memory ability?

(2) How far is it possible to adjust onesidedness of imaging and idiosyncrasies of memory?

Meumann's experiments justify, as he thinks, the conclusion that "the possibilities in improving memory are practically unlimited," that is to say, a given memory ability, through exercise, can be maximally developed. Two individuals who at first required 14 and 49 repetitions for learning a line of 12 syllables, learned finally with 3, sometimes with only 2 repetitions, and he expresses the conviction that *sufficient* practice will lead to the ability of learning such a line after hearing or reading it but once.

With 3 individuals, 36, 40, and 54 years of age, the effect of exercise, although considerable, was less than that of younger persons. At about the 40th year of life it seems, in spite of maximal exercise, a certain deterioration of memory can be noticed. The time of life at which memory ability is at its best, as is borne out by experiments with individuals of from 7 to 54 years of age, is that between 20 and 25. As to point 2, real defects of memory, where total inability of memory for certain elements (a lack of acoustic memory for tones, for instance) exists, cannot be much improved by exercise.

Wherever, on the other hand, a mere predominance of certain sense elements is found, equalization of such individual onesidedness to a certain extent seems possible by continued exercise.

Of the criticisms of these experiments the following may be mentioned:

(1) It may be held that the improvement is due in part to practice in all-around imaging.

(2) It may be said that not only practice in learning nonsense syllables, but the practice obtained in the different tests, learning other material, contributed to the results, and that in determining the present ability for memorizing the different material, not a cross-section, but rather a diagonal cut was made.

(3) It may be objected that the mechanical learning of nonsense syllables does not really constitute exercise of a special memory; that in practicing mechanical memorizing we perfect by practice an element which is coefficient in all learning —a general elementary condition of learning.

As stated before, however, such objections are valid only from the view point of psychology, while for pedagogy the possibility of a general memory exercise may be said to have been established. Still the question arises whether on the strength of a solitary experiment, conducted under conditions differing from those which obtain where it is to be applied, we should make such a far-reaching demand of the school as that of formal memory exercises? And granting that: is there time for such exercises in our already over-burdened schools? Are we justified in asking a development of memory at the cost of other mental faculties?

Moreover, two further considerations, one psychological, the other practical, seem to speak against the introduction of formal memory exercises in the school.

There is, on the one hand, the danger, by choosing nonsense material as the means of exercising memory, of overemphasizing the mere mechanical element of learning, and on the other, the general difficulty of preparing material which would not defeat its own aim.

Let me review in part an outline for such memory exercises, as submitted by Van Biervliet (23), a French psychologist, in order to illustrate what I mean.

"It is unnecessary to show," he writes, "that a sensation, an emotion, an image, remains more profoundly engraved in memory the more vivid the impression by which it was produced. Fortifying the impressions, therefore, means fortifying our memories. We retain that which we have seen, but we retain infinitely better that which we have looked at; we recollect a conversation which we have heard, but we recollect much better a statement we have listened to; we recall that which we have spoken in a natural voice, but much better that which we have solemnly declared."

From this he concludes, that in order to fortify the visual memory we must teach one to look at things; to improve auditory memory, teach one to listen; to strengthen motor memory, teach one to articulate.

For visual memory this may be accomplished by concentration of attention upon, and the exact reproduction of, objects presented. Beginning with simple objects, such as lines of different length, squares and objects of three dimensions, they should gradually become more complex until, finally, shaded forms are exposed to the eye for a few seconds. These the

pupils should be asked to reproduce with pencil from memory as exactly as possible.

For auditory and motor memory the exercise should consist in pronunciation of series of syllables differing in length and in the nature of their formation. They should be made up so as to prevent as much as possible assistance from rational memory.

First, one might propose syllables in which the vowels only differ, such as lalolilalulilo, bibabobubibabobibo. Next, series where the vowel remains the same and the consonants only vary, as lafabarakalamana. Such can be conveniently taken from Sanscrit. Finally, series of syllables in which both the vowels and the consonants differ, as labafigamoru, etc, etc.

Although Van Biervliet's essay is full of important points and valuable suggestions, the shortcomings of his plan for memory exercises are so obvious as to make it unnecessary to elaborate upon them here. If one recalls to mind the ortographic exercises of the so-called Philanthropinists and the long ago abandoned so-called "articulation exercises" of Pestalozzi, it can hardly be expected that this part of his plan will meet with serious consideration.

On the whole, then, it seems not too much to say that the time is not ripe for the adoption of formal memory exercises as a part of the curriculum of the school. What, however, can be advocated with perfect safety is the previously developed theoretical instruction in economical memorizing, a perfection of methods of learning, and above all exercise in economical memorizing in connection with the regular work of the school, by strictly following psychological rules. The needs of these, it seems to me, cannot be too strongly emphasized. Nor do I wish to question the possible advantage of formal memory exercises in particular individual cases. What is insisted upon, however, is that their general usefulness be unquestionably established and that a complete organization of such exercises be based on the combined results of psychological experiment and of practical pedagogy before assigning them as a part of the regular work of the school.

In closing, a brief résumé of the points of practical value for the school may be added :

(1) The urgent need of employing economical methods of learning, which can be met by acquainting the pupils with the value of the various methods of learning and by employing them in connection with the memory work in the school.

(2) The importance of taking into account individual differences,—the idiosyncrasies of the learning types and of the imagetypes ; the necessity of calling a child's attention to the peculi rities of its way of learning, of showing him how to utilize most fully innate memory aids and how to improve upon

them. Out of the former grows the practical problem of the manner of presenting material in the school.

(3) Consideration of the relatively inferior memory capacity of children, which suggests that the memory performance required should be in proportion to the average age of the class.

(4) The factor of fatigue in learning, as bearing upon the behavior of attention; the need of pauses between repetitions wherever a great number is required,—a point which touches upon the practical problem of recess between recitations.

(5) The importance of correct formation of associations and the inhibitory influence of irrelevant associations. A much favored method of teachers is to induce a pupil, by questioning, to find a correct answer for himself. By this method wrong associations are easily formed.

Another reprehensible habit of teachers is that of misleading the pupil by the form in which the question is put. Every wrong answer tends to inhibit recollection of the right one, and questions should be put so as to suggest as nearly as possible a correct one. Correct answers are obtained easier when the same answer fits several questions, wrong answers, when several replies fit the same question.

(6) The economical value of several secondary memory aids, of which the most important are the judicious distribution of repetitions in learning voluminous material, and "the adjustment of the rate of learning to the progress of the memory work."

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TENDENCIES IN PUBLIC SCHOOL ADMINISTRATION.

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The educational system of a progressive modern community is a department of public service second to none in importance, in complexity, or in possibilities for good or ill. For its effectiveness most painstaking, persistent study is necessary, and the city or town that ignores the experience of other communities neglects one of the most important means for improving its own schools.

Realizing the importance, at the outset, of a wide intelligence upon school affairs at home and abroad, the Public Education Association of Worcester has, in this the first year of its organization, made a comparative study of school conditions that may prove of interest to others, as it has already proved to its own members. A series of charts embodying the results of this study presents concisely a mass of facts compiled and computed from the latest national, state and city reports, or obtained by direct correspondence. These facts relate more particularly to Worcester, but material was sought also from all other cities of the United States that in the census of 1900 had a population of one hundred thousand or over, and to this list were added the three smaller neighboring cities, Springfield, Hartford, and Albany, because some features of their school organization might prove particularly suggestive.

By means of these charts certain tendencies in educational matters can be easily recognized. One of the series represents by plotted curves a study of the school population of Worcester for the twenty-one years ending with the latest report yet issued, that of 1904. Worcester is a rapidly growing eastern community, perhaps with a wider diversity in its foreign elements of population than appears in some of the cities represented in the list; still, on the whole, Worcester is an average city, and shows fairly well the general trend in this particular throughout the country. The curves of school enrollment here are at least suggestive of the conditions broadly prevalent in the United States.

During the period covered, the total school enrollment ot Worcester has about doubled. The number of scholars of foreign parentage has invariably been quite in excess of those of

United States stock, and this curve of the total foreign element has noticeably gained in comparison with that of the native. Of the various foreign elements represented, the curve shows the Irish to have been distinctly in the lead, though in 1904 the total number of scholars of Irish parentage was a little smaller than in 1883. The curve next in prominence is that of the Canadian stock, which, however, in 1890 was crossed at a wide angle by that of the Swedish. The Russian curve hardly appears at all at the beginning, but in 1904 it shows an enrollment of nearly twelve hundred. A somewhat similar rate of advance would doubtless appear in the forty other nationalities included in the Worcester census, if this line of inquiry were continued.

The problem of the public schools in assimilating all these rapidly increasing foreign elements into our civilization seems overwhelming, but it will solve itself with the generations. The newer civilization will evidently hardly be American, in the full meaning of that term as it has been understood, but it may be a civilization of no lower order than earlier generations possessed. About one-eighth of Worcester's children of school age are in parochial and private schools. It is safe to conclude that nearly thirty-five hundred of Worcester's school population are being trained at the expense of the Roman Catholic church. This fact, together with the fact of a large number of teachers in the public schools whose parents or grandparents were of foreign birth, shows to what extent the newer races are already appearing actively as factors in educational problems. The rapid advance of the curves of the Russian Jews, the Finns, the Armenians, and others, suggests more complications to follow, and also a wider range of thought and experience and need, to serve as stimulus in meeting the growing responsibility and widening opportunity for public helpfulness.

A second chart shows by proportional areas the relative distribution of the school funds of Worcester and of Springfield for the year covered by the last printed reports, and also the distribution of school population for the same year among the various departments of the educational system,—the high schools, grammar and primary grades, kindergartens, and evening schools. In Worcester the high schools have 8% of the scholars and spend 17½% of the school funds. The kindergartens have 2⅝% of the scholars, and spend 2 9/10% of the school money. The evening schools influence 9⅕% of the pupils and their share of the school appropriation is 4⅕%. The grade schools include about 79% of the school enrollment, and the cost for their maintenance is 75⅕% of the total. To a large proportion of the school population, then, come about equal pro-

portions of the advantage from money spent. Of course the evening schools cost proportionally much less, because they are continued for a far shorter period. On the other hand the grade of work done by the high schools necessitates a far higher cost per pupil, an outlay, however, which needs no words for its justification.

As compared with Springfield, Worcester spent per scholar, for the year, all grades included, $27.28; Springfield, $34.10. Per high school scholar Worcester spent $58.37; Springfield, $81.09. Per evening scholar Worcester spent $12.61; Springfield, $11.34. The average salary per teacher was in Worcester $636.97; in Springfield, $647.98.

The remaining three charts, by far the most widely significant of the series, present a comparative study of public school administration for the thirty-eight cities from which information was received. One of these three charts deals with the size, the election, and the responsibilities of school boards. The marked tendency toward smaller school-governing bodies is unmistakable. Only eight of the thirty-eight cities have boards of over twenty members; only sixteen have boards of over ten; fourteen have ten or fewer. The argument in favor of small boards has been often presented, and needs no reviewing here. The purpose of this study is simply to recognize the widely prevalent fact in the case. On the other hand, Worcester's board of thirty is this year larger by 25% than ever before,—with three exceptions the largest board in the whole list. As a town Worcester had a small school committee. With the addition of each new city ward, politics has repeatedly forbidden merging into the general welfare the sectional opportunity for local prestige. Consequently the school board must grow with the number of wards. With fifty wards, for instance, of course there will have to be a board of one hundred and fifty members, for, consistency being a jewel, each ward must be given a fair share of the advantage to be derived from holding public office.

A second tendency seems to be that toward electoral rather than appointive boards, though several very progressive cities provide for the appointing of their school boards, usually by the mayor. In Philadelphia the appointing power lies with the judges of the court of common pleas, in New Orleans partly with the city council and partly with the governor of Louisiana, and in Washington with the commissioners of the District of Columbia.

From a third column is conclusively shown the popular demand that school interests be absolutely removed from political greed and strife. More and more cities and towns are insisting that the *best* man shall be selected *from the whole community*,

rather than the men most eager for public office, perhaps self-nominated, regardless of any qualification except availability within the limits of a given ward. In a large majority of the cities included in the study, the members are now chosen from the community at large. Only five, including Worcester, cling absolutely to the ward idea. Springfield cannot yet rise fully to the high plane of the majority, but elects one of its school committee at large, the other nine by wards. Jersey City, Columbus, and Providence have a similar plan. Worcester, in this particular, has not even begun the ascent to a higher conception of public welfare, but insists still upon strictly local representation. In some places the popular decision as to the best men for this office is expressed through a special school election, held quite apart from the general election of other officials, where, perhaps, political intrigue for selfish ends must figure for a while longer.

Still another tendency is that toward making the school board a strictly legislative body, and toward employing specialists for the executive work of the school department,—a superintendent of buildings, a superintendent of instruction, and perhaps others. This tendency results in placing greater responsibility upon these salaried officers, with the conseqnence that more and better work is accomplished. The superintendent of instruction is sometimes *ex officio* a member of the board, and has large influence in shaping the general policy of the school system. The lengthened term also gives stability to his position, and helps him better to discharge the duties of his office. Twenty-one out of the thirty-eight cities appoint the superintendent of instruction for a term of four years or over, or else, as in very many cases, his term is unlimited.

One very interesting tendency, brought out in several groups of details, is that toward larger independence and dignity of the school board. The very name given it by most cities is in itself suggestive. "Board of Education," "Board of School Commissioners," "Board of School Directors,"—such titles imply a right to plan and to execute independently of political machine, party dictation, or local and religious prejudice. Any wisely-selected school-governing body should be so broad in sympathies, so judicial in disposition, so liberal in culture, so generous in patriotism, that such an independent position can with perfect safety be granted its members. The great interests involved in training the citizens of the future ought not to be restricted by any mere *committee* of the city council, for a city council has neither the leisure nor the experience for the wise exercise of authority over the educational system. Of course no one will for a moment assert that, in the five New England cities still retaining the old name, School Committee, the posi-

tion of the board is entirely one of subordination. It is everywhere recognized as a body of marked rank and importance, numbering on its list many high-minded, patriotic citizens. This fact, however, must be recognized, that the tendency is unmistakable in the country as a whole toward placing the school board on its own unrestricted responsibility to an extent that some of the older communities have thus far refused to allow. In Worcester, for instance, control of school buildings is in the hands, not of the school board, as would seem fitting, but of an appointee of the common council, by whom janitors and other helpers are hired and to whom they are responsible. The school revenue, also, is merely an appropriation voted each year by that same city council. In Buffalo even the formality of a school committee is dispensed with, and the common council controls the schools directly. With this one exception, however, no city seems, in this matter of independent responsibility on the part of its school board, to have advanced so little way toward the generally accepted principle as has Worcester. As will appear further on, very many school boards throughout the country are granted their own independent revenue, obtained by special tax prescribed by law.

A lengthened term of office on the school board also tends to place the system of public education on more stable footing, and to give it the dignity its importance warrants. A reasonable degree of permanence in any office is conducive to intelligent and interested work on the part of the office-holder. In nineteen out of thirty-six cities furnishing data on this point the term is four years or more. Here again, therefore, Worcester seems to be holding its department of education somewhat back from the unrestricted opportunity and confidence assigned it in a large and growing majority of our leading municipalities. If we are jealous on account of the large privilege of public usefulness our school board may have, it will be well to conquer that selfishness at once. If we are so doubtful of the integrity of school boards in general that we fear to place upon them the full and just responsibility of their position, the sooner we find out their weakness the better for society, so that we may wisely hasten to train up a new generation of patriots strong enough faithfully and honorably to discharge their high duties to the public, when called conspicuously into her service.

In other columns of statistics there is brought out the effort toward greater efficiency in the teaching force. The more direct and stronger influence of the specially trained superintendent in the particular duty of selecting and appointing teachers is calculated to promote such effectiveness. In some cases he personally makes the appointments without the formality of a board vote. Of some significance also is the average

number of scholars per teacher, though facts here are liable to prove misleading. A large number of special teachers causes the average to seem unduly small, or particular schools may be temporarily depleted by the opening of parochial schools in the district, or local business conditions may for a time cause marked fluctuations. Worcester's average of thirty-two certainly implies no tendency to overcrowd the school-rooms. The average in thirty cities is a little under thirty-six.

One of the charts relates exclusively to public school finance, and brings out, among other things, the growing tendency to fix by law the amount of school revenue, and thus, as has already been shown, to place the educational system on a definite footing, independent of annual appropriations by the city government. This fixed school rate is usually stated as a certain number of mills on a dollar of valuation, which is, of course, equivalent to a certain number of dollars on a thousand of valuation,—the form of statement followed in many sections of the country. There are marked advantages in making the school revenue a definite amount that can be counted upon from year to year, though it cannot be doubted that Worcester's common council has thus far provided with some degree of liberality for public education. The average of $27.28 per pupil, as computed from data in the last printed report, compares favorably with the corresponding averages in other cities. The average of all the averages included in this column is $28.06, showing Worcester to be the eighteenth in the list.

In another connection is shown the proportion of school revenue derived from local taxation. In many cities included in the list, state or county appropriations provide largely for public school maintenance. Worcester, on the contrary, is almost wholly dependent on the city tax for the nearly two-thirds of a million dollars it annually spends in preparing the coming generations for citizenship. Five dollars and twelve cents on every thousand dollars of property valuation went last year for the support of the public schools, $28\frac{2}{5}\%$ of the total tax levy. 15% was devoted to the care of the schools, $10\frac{3}{10}\%$ to the fire department, $7\frac{6}{10}\%$ to the police system, and $4\frac{2}{10}\%$ to the care of the poor. Nearly twice as much, then, went for schools as for any other single public interest.

Evidently Worcester rightly recognizes her schools as of prime importance, and intends to provide reasonably for their maintenance. In some particulars she is falling far back toward the rear of progress in educational matters, if not in their financial support. Even so, she may represent the cities of her class in yielding sometimes to inertia before a complex problem; in forgetting, in the pressure of attaining to self-consciousness, to guard against the unworthy ambition of

politicians or selfish office seekers; in failing, under the stress of material gain, to regard quite seriously enough the pre-eminent importance of well-disciplined character in the citizens of the coming generations. Most of our cities are doubtless alike in feeling some just pride in what the public schools have already accomplished, and in honoring the many noble workers for them and in them to-day. The past, at least, may be secure. The present we may prefer to idealize, finding comfort in what we "aspired to be" and were not. But the future of our educational system will be vastly richer if we of the present watch the signs of the times, and welcome any suggestions of improvement that may come to us through the perhaps dearly bought experience of sister cities that have successfully struggled with the complex educational problems of our country and of our age.

BOY LIFE IN A MASSACHUSETTS COUNTRY TOWN FORTY YEARS AGO.[1]

By G. Stanley Hall.

Betweeen the ages of nine and fourteen, my parents, who then lived in a distant town, very wisely permitted me to spend most of the school-less part of these five years, so critical for a boy's development, with a large family on a large farm in Ashfield of this State. Although this joyous period ended long ago, the life, modes of thought and feeling, industries, dress, etc., were very old-fashioned for that date, and were tenaciously and proudly kept so. In more recent years, as I have come to believe that nowhere does the old New England life still persist more strongly or can be studied more objectively, I have spent portions of several summers, with the aid of a small fund placed in my hands for the purpose, in collecting old farm tools, household utensils, furniture, articles of dress, and hundreds of miscellaneous old objects into a local museum, a little after the fashion of the museums of Plymouth, Salem and Deerfield. I have interviewed all the oldest inhabitants for details of customs, industries, persons, become interested in a map of the original farms, verified in part by old walls and cellar holes and apple trees, and compiled a brief history of the town. My vacation interest grew into a record partly because so many facts of the early life and thoughts of old New England are still unrecorded and are now so fast passing beyond the reach of record, with the lamented decay of these little old towns, partly because despite certain evils this life at its best appears to me to have constituted about the best educational environment for boys at a certain stage of their development ever realized in history, combining physical, industrial, technical with civil and religious elements in wise proportions and pedagogic objectivity. Again, this mode of life is the one and the only one that represents the ideal basis of a state of citizen voters as contemplated by the framers of our institutions. Finally, it is more and more refreshing in our age, and especially in the vaaction mood, to go back to sources, to the fresh primary thoughts, feelings, beliefs, modes of life of simple, homely, genuine men. Our higher anthropology labors to start afresh from the common vulgar standpoint, as Socrates did, from what Maurice calls the Ethos, and Grote the Nomos of common people, and of a just preceding and a vanishing type of civilization, to

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be warmed with its experience and saturated with its local color.

I have freely eked out the boyish memory of those five years with that of older persons, but everything that follows was in Ashfield within the memory of people living there a few years ago. Time allows me to present here but a small part of the entire record, to sample it here and there, and show a few obvious lessons.

I begin with winter, when men's industries were most diversified, and were largely in *wood*. Lumber—or timber—trees were chopped down and cut by two men working a cross-cut saw, which was always getting stuck fast, in a pinch which took the set out of it, unless the whole trunk was pried up by skids. Sometimes the fallen trees were cut into logs, snaked together, and piled with the aid of cant-hooks, to be drawn across the frozen pond to the saw-mill for some contemplated building, or, if of spruce, of straight grain and few knots, or of good rift, they were cut in bolts, or cross-sections of fifteen inches long, which was the legal length for shingles. These were taken home in a pung, split with beetle and wedge, and then with a frow, and finished off with a drawshave, on a shaving-horse, itself home-made. These rive shingles were thought far more durable than those cut into shape by the buzz-saw which does not follow the grain. To be of prime quality these must be made of heart and not sap wood, nor of second growth trees. The shavings were in wide demand for kindling fires. Axe-helves, too, were sawn, split, hewn, whittled, and scraped into shape with bits of broken glass, and the forms peculiar to each local maker were as characteristic as the style of painter or poet, and were widely known, compared and criticised. Butter-paddles were commonly made of red cherry, while sugar lap paddles were made by merely barking whistle wood or bass, and whittling down one end for a handle. Mauls and beetles were made of ash-knots, ox-bows of walnut, held in shape till seasoned by withes of yellow birch, from which also birch brushes and brooms were manufactured on winter evenings by stripping down seams of wood in the green. There were salt mortars and pig-troughs made from solid logs, with tools hardly more effective than those the Indian uses for his dug-out. Flails for next year's threshing; cheese-hoops and cheese-ladders; bread-troughs, and yokes for hogs and sheep, and pokes for jumping cattle, horses and unruly geese, and stanchions for cows. Some took this season for cutting next summer's bean and hop poles, pea bush, cart and sled stakes, with an eye always out for a straight clean whip stock or fish pole. Repairs were made during this season, and a new cat-hole beside the door, with a laterally working drop-lid, which the cat operated with ease, was

made one winter. New sled neaps, and fingers for the grain cradle, handles for shovels and dung-forks, pitchforks, spades, spuds, hoes, and a little earlier, for rakes; scythes and brooms were home-made, and machines and men of special trades were so far uncalled for. Nearly all these forms of domestic woodwork I saw, and even helped in as a boy of ten might, or imitated them in play in those thrice-happy days; while in elder pop-guns, with a ringing report, that were almost dangerous indoors; hemlock bows and arrows, or cross bows, with arrowheads run on with melted lead (for which every scrap of lead pipe or antique pewter dish was in great demand) often fatal for very small game; box and figure 4 traps for rats and squirrels; windmills; weather vanes in the form of fish, roosters or even ships; an actual saw-mill that went in the brook, and cut planks with marino and black and white Carter potatoes for logs; and many whittled tools, toys and ornamental forms and puppets;—in all these and many more, I even became in a short time, a fairly average expert as compared with other boys, at least so I then thought. How much all this has served me since, in the laboratory, in daily life, and even in the study, it would be hard to estimate.

The home industry in woolen is a good instance of one which survives in occasional families to this day. Sheep, as I remember, could thrive on the poorest hay, or orts, the leavings of the neat cattle. In summer they could eat brakes and polipods, if not even hardhack and tansy, and would browse down berry briers and underbrush, while their teeth cut the grass so close that cows could hardly survive in the same pasture with them. The spring lambs were raised in the shed by hand, sometimes as cossets by the children, who often derived their first savings therefrom. Sheep washing day was a gala day when, if at no other time, liquor was used against exposure; and shearing, which came a week or two later, was hardly less interesting. A good shearer, who had done his twenty-five head a day, commanded good wages, seventy-five cents or a dollar a day; while the boys must pull the dead sheep, even though they were only found after being some weeks defunct. Fleeces for home use were looked over, all burrs and shives picked out, and they were then oiled with poor lard. "Bees" to do this were often held. Carding early became specialized, and carders were in every town, but the implements were in each family, some members of which could not only card, but could even use the fine, long-toothed worsted combs in an emergency. The rolls were spun at home, novices doing the woof or filling, and the older girls the warp, which must be of better quality. It was taken from the spindle sometimes on a niddy-noddy held in the hand, at two rounds per yard, but more com-

monly on a reel, in rounds of two yards each. Every forty rounds was signalized on a reel by the snap of a wooden spring or the fall of a hammer, and constituted a knot, four, five, seven, or ten of which (in different families and for different purposes) constituting a skein, and twenty knots making a run. Four seven-knotted skeins of filling, or six of warp was a day's work, though now, I am told, few young women can accomplish so much without excessive fatigue. The yarn, doubled if for stockings, after being washed clean of grease, next went to the great dye-tub in the chimney corner. Butternut bark for every-day suits, indigo for Sunday suits, and madder for shirting was the rule. There were also fancy dyes and fancy dyeing, braiding, binding tightly or twisting in a white thread to get the favorite hit or miss, or pepper-and-salt effect, a now almost incredible ingenuity in making up figures and fancy color effects for loom patterns in girls' dresses. Next the filling was quilled and the warp spooled, the former ready for the shuttle, and the latter for the warping bars (both of these latter being often home-made), to which it goes from the scarn or spool-frame. In warping, the leese must be taken with care, for if the order of the threads is lost they cannot be properly thumbed through the harnesses and hooked through the reed, and are good for nothing but to make into clothes lines and the piece is lost. A raddle also acts in keeping the warp disentangled and of proper width before the lathe and tenters can hold it. Sometimes blue and white shirt-formed frock cloth was woven, sometimes kerseys and plaid dress patterns of many colors, or woolen sheets, and even woolen pillow-cases, which were as warm and heavy, although coarser, than those the olfactorial zoölogist Jäeger advises, and sells to his followers. The complication of harnesses and treadles required to weave some of the more complicated carpet, and especially coverlid patterns, evinced great ingenuity and long study, and is probably now, although the combinations were carefully written down, in most communities a forever lost art. On coming from the loom the cloth was wet for shrinkage, and the nap picked up with cards of home grown teasels and sheared smooth on one side, although in those days this process had already gone to the local fuller. Coarse yarn was also spun from tag-locks, which was, of course, home carded. Knitting was easy, pretty, visiting work. Girls earned from two to three York shillings a pair for men's stockings, paid in trade from the store, which put out such work if desired. Shag mittens were knit from thrumbs or the left-over ends of warp. Nubias and sontags were knit with large wooden needles, and men's gloves, tidies, and clock stockings with ornamental open work in the sides were knit with one hook, and the tape loom held between the knees was kept going evenings.

Domestic flax industry still lingers in a few families. The seed was sown broadcast and grew till the bolls were ripe, when it was pulled and laid in rows by the boys and whipped, in a few days, to get the seed for meal. After lying out of doors for some weeks till the shives were rotten, it was put through the process of breaking on the ponderous flax-break. It was then swingled, hatchelled, and finally hanked. It was then wound on the distaff made of a young spruce top, and drawn out for spinning. Grasshopper years, when the fibre was short, this was hard, and though ticking, meal bags and scratchy tow shirts could be made, finer linen products were impossible. After weaving it must be bleached in a good quality of air.

However it was with adults, child life was full of amusements. Children were numerous in every neighborhood, and though they were each required to be useful, they were in early years left much to themselves and were at home in every house, barn, or shed, within a mile or more. There was, of course, coasting, skating, swimming, gool, fox and hounds, and snowballing, with choosing of sides, lasting for a whole school term, with elaborate forts; cart wheel and men o' morn's in the snow; collar and elbow, or square hold wrestling, with its many different trips, locks and play-ups—side and back hold being unscientific; round ball; two and four old cat, with soft yarn balls thrown at the runner. The older girl-boys spent the hour's nooning in the schoolhouse and either paired off for small games or talks, or played "Here we stand all round this ring," "Needle's eye," "Kitty corners," or "Who's got the button." As in the age of Shakespeare the queen's maids of honor played tag, so here all children, and even adults often played child's games with gusto. In the family, as they gathered about the stove, or sometimes about the grand old fireplace in the back kitchen, with its back-log, crane, pot hooks and trammels, there were stories of the old fort, of bears, wild cats, Indians and Bloody Brook, and other probably unprinted tales perhaps many generations old. There were some who could sing old English ballads that had come down by tradition, and which had never been in print in America, and more who could sing a comic song or pathetic negro melody. Lord Lovel, Irving, Bunyan, *The Youth's Companion* and many Sunday-school books were read aloud. A pair of skates was earned by a boy friend one winter by reading the entire Bible through, and another bought an accordion with money earned by braiding the plain sides of palm-leaf hats where no splicing was needed, for the women at a cent per side. All families allowed the game of fox and geese, a few permitted checkers, and one, backgammon, which was generally thought to be almost gambling; dominoes were barely tolerated, but riddles, rebuses and charades were in high

favor by old and young, and were published in all the local weekly papers. It was here that I learned that card playing, which I had often seen before but did not much understand nor care for, was very wrong, and a boy friend was taught old sledge, and euchre, up over the horse sheds on Sundays between services, by an older son of the officiating minister. There were hull-gull; cats-cradle with two series of changes; string and knot puzzles; odd and even, and most of the games, and many more than those in Mr. Newel's charming, and largely original, book entitled, "The Plays and Games of American Children," connecting many of them conclusively with the sports and pastimes of the English people in the merry olden time of Brandt. One maiden lady, whom we all loved, could spell "The Abominable Bumble Bee with his Head Cut Off," in an inverse House-that-Jack-built fashion, with a most side-splitting effect. There was the charming story of the big, little and middle sized bear, and I recall the thrill when at the turn of the story, "the dog began to worry the cat, the cat began to kill the rat, the rat began to eat the corn," etc. There were beech- and chestnutting parties; raisings; and days set apart for all the men in the district being warned out by the surveyor to gather and work on the roads with teams. Work was easy, as it was for the town, and stories were plenty. There were huskings, with cider and pumpkin pie, and games on the barn floor, when it was cleared of corn; paring bees, with bobbing, swinging a whole paring thrice around the head, thence to fall on the floor in the form of the fancied initial of some person of the other sex; and counting seeds to the familiar doggerel—one I love, two I love, three I love I say, four I love with all my heart, and five I cast away, etc. Here the apples were quartered and strung, and hung in festoons to dry all over the kitchen. There were quilting bees for girls about to marry, where the men came in the evening and partook of the new species of rice pop-corn, served in two large milk pans, with, perhaps, the most delicious home-made spruce and wintergreen beer. Spelling schools in which the parents took part, and where the champion spellers of rural districts, after exhausting several spelling books, agreed to spell each other down on an abridged Worcester's dictionary. There were weekly evening singing schools in winter, and several of us taught ourselves or each other to play the accordion, and fiddle by rote, to dance single and double shuffle on a board, and the steps of waltz, polka and schottische. Even square dances were attempted to our own music, if we could get a caller-off. This latter was here a stolen sweet, as was the furtive reading of the thrilling tales of the *New York Ledger*, especially those of Sylvanus Cobb, sets of which were smuggled around among the boys and

read after retiring, or in sheep shed, hay mow, or attic, on rainy days. I must not forget the rage for trapping and hunting, by which we learned much of the habits of crows, hawks, muskrats, woodchucks, squirrels, partridges and even foxes, and which made us acquainted with wide areas of territory. In a regular squirrel hunt organized by choosing sides, and a dinner to the victors paid for by the vanquished party, as determined by counting tails, boys of my age were not old enough to participate. We made collections, however, for whole seasons, of heads, legs, wings, and tails, as well as of woods, leaves, flowers, stones, bugs, butterflies, etc.

The dull days in haying time brought another sort of education. The men of the vicinity strolled together in a shed, and sitting on tool bench, grindstone, manger, wagons, chopping blocks, and hog spouts, discussed crop prices, ditching, walling, salting cattle, finding springs with witch hazel, taxes, the preaching, the next selectmen, fence-viewer, constable, and, I suppose a little earlier, wardens, leather sealers, deer reeves, surveyors of shingles and clapboards and of wheat, field drivers, tithing men, clerk of the market, and pound-keepers, as well as the good brooks and ponds for trouting, or snaring pickerel with brass wire loops and a white-birch-bark light at night, and every sort of gossip. The old uncles who came to be the heroes of current stories, and who were, in a sense, ideal men, were shrewd and sharp, of exceeding few words, but these oracular, of most unpromising exteriors and mode of speech, with quaint and eccentric ways which made their quintessential wisdom very surprising by the contrast; while in weather signs and in drugs the old Indian was sometimes the sage. At the opposite extreme was the unseasoned fellow who can be fooled and not get the best of it if he was "run" or played some practical joke. Absurb exaggerations told with a serious air, to test the hearer's knowledge or credulity, were the chief ingredients of this lowery-day wit. Thus the ass's head was not unfrequently clapped on some poor rich fellow, green from the city, or some larger town, suspected of the unpardonable sin of being "stuck up."

In this air a good "nag" has great viability. As a boy here, *e. g.*, I often played hunt, snapping a disabled old flint-lock musket at every live thing in field and forest, for which an adult neighbor used to "run" me unmercifully before the whole shed. Years after, when I was at home on a college outing, he had not forgotten it, and for perhaps a dozen summers since I have met it. On a recent evening, when walking with a dignified city friend, he met me with the same old grind, "Hello, huntin' much this summer with Philander's old gun?" as he slapped his thighs and laughed till the hills rang, and, though

I did not hear him, I am no less certain that he said to the neighbor with him, when they had ridden well by, that I was always a pretty middlin' good sort of a fellow after all, and was n't stuck up. The joke will no doubt keep fresh another quarter of a century if my friend lives, and there are many more of the same kind. Another grind at my expense illustrates the inventive cleverness of this old Yankee type. As one of the speakers at an annual dinner in honor of the old town Academy, I had been several times introduced as a specimen of the former students of the Academy. One night, at the crowded post-office, this shrewd old farmer told, in my presence and for my benefit, the story of old Joe W., who went on the road as a drummer for the old tannery. He said Joe had just experienced religion, and was just then so all-fired honest that he selected, as the samples he was to sell from, pieces of sole leather a trifle below the average quality, instead of above, as an honest drummer should do. He was afraid to hope that Professor N., who presided at the dinner, had experienced religion, but leastways he was so all-fired honest that he leaned over backwards worse than old Joe in calling me out as a sample Academy boy, for although I was middling smart there was not a boy of them who was n't a plaguey sight smarter than I was. Another of his stories was of Stephen and Ann. They were courting, and she had sat in his lap in the kitchen one Sunday evening for some hours, when she suddenly asked if he was not tired. He gallantly replied, "Not a mite, Ann, keep right on settin'. I was awful tired an hour ago, but now I am numb." That is the way he said it was probably with my hearers and pupils.

Then there was the story of old Deacon S., who sold home-made cider brandy or twisted cider, at the rate of twenty-five cents per gallon, but who always used to get his big thumb into the quart measure, which had lost its handle, displacing its cubic contents of brandy. There was another tale of Captain A., who being cheated in a horse trade by Mr. B., called all his sons and grandsons together solemnly, as if for family prayers, told them the circumstances, and enjoined them to cheat B. back to the amount of six dollars, and if they did not live to do it to teach their children and grandchildren to cheat his descendants to the end of time; but a few months later, after another trade with B., the captain convened his family again to say that the score had been paid with interest, and to release them from the covenant. There was the story of Uncle G., who began his courtship by "creepin' in, all unbeknown," behind his best girl, stealing up close behind her as she was washing dishes, hat on and chair in hand, with the salute, "Well Sal, feel kind'er sparky to-night?" to which she coquet-

tishly but encouragingly replied, "Well, I reckon p'raps a *leetle* more sorter than sorter not;" and how at last, the minister being away, they rode together on one horse twenty miles alone, and were married. There was the legend of old Squire V., who used to be a great favorite with the girls. Driving up to the town clerk's door one day he told him to have him "published" the next Sunday with Miss B. and drove off. Soon he returned and desired the name changed to Miss C., and finally, after several changes and some minutes of profound deliberation, settled on Miss H., whom he married. There was the tale of the turning of the Deerfield River by the two great but mystic ancestors of one family in town. It once flowed down the gap in Mr. P.'s pasture, through the pond and over the plain of the village, and was stipulated as the northern boundary of the possessions of these pioneers. They were ambitious, and had noticed that new settlers and their depredations followed rivers, so they hired hundreds of Indians to dig with sharpened sticks, day and night, one entire summer, till the stream at length washed over down a more northerly valley so suddenly as to sweep away the dusky maiden beloved by one of the pioneers; with many other romantic incidents. There was the story of the old horse jockey G., who in his travels found a negro of great strength but so simple as to agree to work for him a hundred years, on the expiration of which time the old jockey was to give him all the property and serve him a century; and who cured him of the inveterate habit of sucking eggs by showing him a dozen, apparently freshly laid, in his bed one morning just after he had risen, and frightening him out of the practice by convincing him that he had laid the eggs while he slept. There was the story of the old cat ground up in the mill with dreadful caterwaulings, and of the two bushels of good rye required to grind the millstones clean again. Another, was of the case, famous in history, of the non-conforming Baptist deacon who would not pay his town tax to support the Congregational preaching, and whose apple trees were dug up by the constable and sold for payment; of the deacon's going to Boston to the General Court, and of his return with a barrel of cider brandy drawn on two poles strapped together, one end of each in the hold-backs and the other end dragging on the ground. There were stories of a noted lady pioneer in the cause of female education, who solicited domestic utensils and produce of every kind for a young ladies' seminary, following the men into stable and around hay mow in her quest; of old Heeber, suspected of witchcraft, who lived apart and was buried outside the cemetery; of old Sloper, who had no friends, and vanished so mysteriously that gradually a detailed story of his murder by a

prominent, but not beloved, citizen was evolved; of the old church, stone cold in winter, with two services and sermons from ten to four, and in summer with the rocks black at nooning with people, mostly members in close communion, eating their Sunday dinner, and picking caraway or meetin'-seed; of the waste of timber, or the greed of individuals in shacking hogs on the then extensive undivided land or common, and even of the secular variations of the compass to account for the disparity between the old surveys of boundary lines and new ones.

Evenings in the kitchen were spent in light work and gossip unremitting. Candles, in olden times before cotton, it is said, were made by loosely spinning tow-wicking. Candle rods were then whittled out or cut from cat-tails, on which wicking for a dozen candles was put, and they were hung over the back of an old, high, straight-backed chair tipped down, and dipped every few minutes in beef, or better, mutton tallow melted in the tin boiler. Of course candles grew faster on cold days, but were more likely to crack. Good iron candlesticks were rare, and at balls and parties potatoes were used, and wooden blocks. The evolution, I have heard, was first a "slut" or linen rag in fat, or a bowl of woodchuck's oil with a floating wick through a wooden button. Later came a square strip of fat pork with a thin sliver of wood thrust through to stiffen it and serve as a wick. Fire could still be made by friction of wood in an emergency. The best-raked fire would sometimes go out, and then fire must be borrowed from a neighbor. Those who wished to be independent obtained tinder-boxes with flint and iron, smudged tow and punk. Home-made matches, with brimstone and saltpetre, would catch readily, but friction matches were a great novelty. One of these friction matches, also home-made, of spruce lumber, by the boys, was "drawed" by their incredulous father, who, when he found it would really go, put it carefully in his pocket for future use.

The ideal hearth and fireplace of olden times (restored at Plymouth, and especially at Deerfield, Mass., by George Sheldon,) was indeed the centre about which the whole family system revolved. On the swinging crane, evolved from the earlier wooden lug-pole, hung from pot-hooks, chains and trammels, several species of iron pots and brass kettles, in front of a green back-log, so big and long that it was sometimes snaked in by a horse. Below, attached to the upright part of the andirons, was the turnspit-dog, revolved by hand, and sometimes, at a later date, by clockwork, for fancy roasts. There were roasters and dripping pans, and the three-legged spider, in which bread was baked, first on the bottom and then, tipped up to the coals, or else the top was done by a heavy red-hot

iron cover. Here rye used to be roasted and mortared for coffee, which was later boiled in water and maple molasses. On the shelf or beam above the fire stood the foot stove, a horn of long and another of short paper lamplighters; a sausage stuffer; tin lanthorn; mortar; chafing dish; runlet; noggin; flatirons, perhaps of new fashion, hollowed for hot iron chunks; tinder box; tankard; and coffee pots; and high above all a bayoneted flint gun or two, with belt, bayonet sheath, brush and primer. Overhead on the pole hung always a hat or cap on the end, and perhaps a haunch of dried beef, with possibly a ham, a calf's rennet stretched with a springy willow stick inside; pumpkins cut into long ringlets; bundles of red peppers; braided seed corn and dried apples, the latter also perhaps half covering the roof and south side of the house. About the fireplace stood or hung the bed-warmer, the tongs, and long "slice," a hollow gourd or crooked-necked squash; candle holders with long tin reflectors; bellows; woolen holders; toasting irons; smoking tongs; pewter porringer; spoon moulds; trivet; skillet and piggin; a tin kitchen; a tin baker and steamer; a flip iron; the big dye tub always in the corner, and the high-backed settle in front. Near by stood the cupboard, displaying the best blue crockery, and the pewter, kept bright by scouring with horsetails (equisetum); sealed measures, and a few liquids, and perhaps near by a pumpkin Jack-o'-lantern, with an expression when it was lighted in the dark as hideous as that of the head of an Alaskan totem-post.

The grandma was both nurse and doctor, and the children had to gather for her each year a supply of herbs. Chief among these were pennyroyal, tansy, spearmint, peppermint, catnip, thoroughwort, motherwort, liverwort, mugwort, elecampane, opodeldoc, burdock, mayweed, dogweed, fireweed, ragweed, pokeweed, aconite, arnica, scratch-grass, valerian, lobelia, larkspur, mullein, mallow, plantain, foxglove or nightshade, osier, fennel, sorrel, comfrey, rue, saffron, flag, anise, snakeroot, yarrow, balmony, tag alder, witch-hazel, and bloodroot. Each of these, and many more, had specific medicinal properties, and hung in rows of dried bunches in the attic, and all grew in Ashfield. In Mr. Cockayne's Leechdom, Wortcunning and Starcraft, a remarkable collection of Anglo-Saxon medical prescriptions, I have identified the same symptoms for which the same herb was the specific, showing how this unwritten medical lore, as Mr. Mooney calls it in his interesting pamphlet, survives and persists unchanged.

The attic floor was covered a foot deep with corn on the ear, to be shelled winter evenings by scraping across the back of a knife driven into a board; the cobs being fed out to stock, or used for baking and smoking fires. Here, too, were tins and

boxes, and barrels of rye and barley, and, later, oats, wheat and buckwheat. In the corner stood, or hung, perhaps, a hand-winnower, a tub of frozen cider apple sauce, an old hat and wig block, a few woodchucks' skins to be made into whip-lashes, a coon skin for a cap, a hand-still for making cider brandy or twisted cider. So, too, the cellar, shed, hog-house, barn, sheep and horse barn, sugar-house and corn-house, were stored with objects of perennial interest to boys.

The "sense of progress," which a recent psychological writer calls a special, though lately evolved, sense, was by no means undeveloped. Men loved to tell of old times, when maple sap was caught in rough troughs made with an axe, and stored by being simply turned in their places; to show the marks on old maple trees, where their grandfathers tapped by chipping with a hatchet and driving in a bass-wood spout made at a blow with the same iron gouge that prepared for its insertion, and to describe how, later, the rough unpainted tubs with unbarked hoops, and, because smaller at the top, so hard to store and carry, and so liable to burst by the expansion of the ice on freezing, were superseded by the Shaker pails. The old days when sap was gathered by hand with a sap yoke, and stored in long troughs and boiled out of doors in a row of kettles on a pole or crotches, were talked over, with complacent pity, perhaps, while modern pans on a new arch and in a new sugar-house were kept going all night during a big run which had filled every tun and hogshead, while the best trees were running over.

Hour-glasses, especially to spin by, and dials, were sometimes used, and there were many noon-marks at intervals over the farm. In many families, even where coal and kerosene stoves are used, along with wood, oven-wood is still cut for the old brick oven, which Christmas time, at least, if not once every week or two through the winter, is heated, and then swept out with a wet birch broom. First, the rye and Indian bread is made up in a bread trough and then put on the broad, meal-sprinkled peel, with hands dipped in water to avoid sticking, and very dexterously thrown in haycock and windrow shapes, perhaps on cabbage leaves, on to the bottom of the oven. When this was done it was still so hot that pies could be baked, and last of all, a bushel of apples was thrown in and the week's baking was over. Many could then tell of the time when, with pudding or mashed potatoes and milk for the meal, no table was set, but each took a bowl of milk and helped himself from the kettle on the stone; or again, the family gathered about the well-scoured table, with no individual plates or butter knives, or waiting on the table, but each took a slice of bread and helped himself from the meat dish, or dipped the

brown bread into the pork fat with forks. Wooden, pewter, then earthen plates, was the order of evolution. So, in the dairy, milk used to be set in wooden trays, then in thick, brown earthen bowls, before the modern milk-pans came into vogue. The evolution of the skimmer from the clam shell, through a rough wooden skimmer; of churning, from a bowl and paddle on to the old dasher churn; of straining milk, from the linen rag strainer, up; of bails, from the ear and peg fashion, on; the history of the artistic forms of butter balls, and the stamps used; the very gradual development of the scythe-snath, which no artist ever represents correctly, to the present highly physiological and very sharply discriminated forms, as well as of the hoe and pitchfork; why are not these and the growth of the corn-sheller, hen-coop, plough, mop, the story of the penstock, the broom, from a bush or bundle of twigs, up through the birch broom with fibres stripped both up and down; of window transparencies, from the hole and oiled paper, etc., as scientific anthropological themes, as the evolution of the fish-hook, arrow-head and spear? Why is not the old soap-making process, with the lye, strong enough to support an egg, dripping from the ash barrel on the circularly grooved board or stone, and the out-of-doors boiling and basket straining, etc.; why is not the old-fashioned semi-annual geese-picking day, with the big apron, great vase-shaped goose basket, and the baby's stocking drawn over the goose's head to keep it from biting; why is not cheese making, when the milk from three families was gathered in a big tub, coagulated with a calf's rennet, broken up into curds and whey by the fingers, scalded, chopped, salted, perhaps saged, hooped, turned, and pared of those delicious curds, and daily greased all summer; why is not the high festivity of road breaking in winter, when all the men and oxen in the neighborhood, often twenty yokes of oxen in one team, turned out after a long storm and blow to break out the roads which the town had not discontinued for the winter, to church, stores, doctor and school, when steers were broken in, sandwiched between the yokes of old cattle, where often up to their backs in a drift, with a sled to which ploughs were chained to each side and a dozen men and boys on it, they could only wait, frightened and with lolling tongue, to be shoveled out; why are not the antique ceremonies and sequelæ of butchering day, and the fun and games with pluck and lights and sausages, which city-bred boys were told, and said to believe, are caught like fish; the process of making pearl-ash and birch vinegar; cider-making; the manifold summer beers and other domestic drinks, etc., quite as worthy of investigation, of illustration in museums, as the no more rapidly vanishing customs of savage tribes?

At the place and time of which I write many domestic industries were more or less specialized. Farmers' sons often went away to learn trades. Broom making, *e. g.*, was the evening occupation of one member of the family I knew, and I saw the process of planting, breaking, tabling, hatchelling, for the seed was worth about the price of oats, bleaching with brimstone in a big down cellar, etc. Tying was the most interesting process. It included arranging the hurls, braiding down the stalks on the handle with wire, pressing in the great vise, and sewing with a six-inch needle, thimbled through by leather palms. I was allowed to sandpaper the handles, and once, in a time of stress, when a man was making forty plain Shaker brooms per day, even to put on the gold leaf. The local tanner allowed us to run among his vats, and see the hides salted, pickled, washed and limed, and, best of all, skived over the big beam. Last summer this tanner told me he believed his eighteen months in tanning an ox hide and the six weeks required by modern chemical methods, represented about the relative durability of the two leathers. His trade has lasted on, despite such competition, because his townsmen have something the same idea. Within boy-range, too, was a cooper's shop, a gunsmith, a family who made baskets, a small carding mill, turning shops where wooden spoons, bowls, sieve rims, pen handles, plain broom handles, etc., were made, a general tinker and solderer, besides carpenters, blacksmiths, shoe and harness makers. Some farmers specialized, more or less, in sheep; others in young cattle, or pigs and horses. Some were always lucky with corn, others with rye or wheat, buckwheat, potatoes, grass, etc., to which they had mainly settled after much experiment, or to which the traditions of the farm or family inclined them. Thus, in fine, there were many grades of progress and versatility. Many of these old home industries I can still practice and have added to them by "lessons" in Germany. All come handy in the laboratory. I know I could make soap, maple sugar, a pair of shoes, braid a palm leaf hat, spin, put in and weave a piece of frocking or a rag carpet, do crude carpentry, farm and dairy work, and I envy the pupils at Tuskegee who can do more of these things and better than I.

I have alluded to but few of the occupations of these people. Their commonest industries—planting, fertilizing, gathering each crop—have been revolutionized by machinery and artificial fertilization within twenty-five years. These, and their religion and beliefs, and domestic social customs, methods of doing their small business, are all fast changing. The women are haggard and worn with their work, the men are sometimes shiftless, and children are very rare. The heart of these communities has left it, and only the shell remains. The quaint,

eccentric characters that abound in these towns, types of which may be found faithfully depicted by Mary E. Wilkins or in Mary B. Claflin's "Brampton Sketches," or in a few of the sketches in "Profitable Tales," by Eugene Field, are for the most part types of degeneration well recognized by alienists and characterized by Morel. These are quite different from the no less rustic characters in De Gaspe's "Old Canadians, or the work of Du Pray's School." Life then and there, although perhaps a century or more later than that described in the books of Alice Morse Earle, did not differ much from it. Did the earlier generations work too hard in digging stumps and stones, and laying the hundreds of miles of heavy stone wall and clearing the timber? Were the conditions of life too severe? Is our race not adapted to the new conditions of climate, soil, water, and, as Dr. Jarvis said, is it still a problem whether the Anglo-Saxon race can thrive in its new American home, or is this but an incident, an eddy in the great onward current of progress? I have no answer, but I know nothing more sad in our American life than the decay of these townlets.

Nowhere has the great middle class been so all-controlling, furnished so large a proportion of scientific and business leaders, been so respectable, so well combined industry with wealth, bred patriotism, conservatism and independence. The farm was a great laboratory, tending, perhaps, rather more to develop scientific than literary tastes, cultivating persistency, in which country boys excel, if at the expense of versatility. It is, says Prof. Brewer, the question with city parents what useful thing the children can do; while in the country, where they are in great demand on the farm they are, in a sense, members of the firm. Evenings are not dangerous to morality, but are turned to good account, while during the rowdy or adolescent age the boy tendency to revert to savagery can find harmless vent in hunting, trapping, and other ways less injurious to morals than the customs of city life.

Some such training the heroes of '76 had; the independent conditions of communities like this was just the reverse of that of the South at the outbreak of the Rebellion; such a people cannot be conquered, for war and blockade would only drive them back to more primitive conditions; and restore the old independence of foreign and even domestic markets. Again, should we ever have occasion to educate colonists, as England is now attempting, we could not do so better than by reviving conditions of life like these.

I close by mentioning an interesting new educational experiment, as a bright spot in this sombre present, which was somewhat feebly but happily tried in Ashfield, as a result of the recently awakened interest in its own antiquities. A prominent

citizen, once a teacher, has studied from sources largely unprinted the history of the town, which connects it with the Revolution, and even the French and Indian wars, and on the lines of old map he has made of the original town surveys, gave an hour per week during part of a winter in teaching history, from a local standpoint in the little academy, with its score of pupils, and adding many of the antiquities such as this paper has referred to, with free use of the museum, and all with excellent results. A village pastor, who is an excellent botanist, took the class a few times each year on excursions, and the older girls have gathered and pressed for him in a school museum all the Ashfield plants and grasses, on the basis of which he taught a little botany gratuitously. The Doctor co-operated with them and talked on physiology and hygiene, and brought his miscroscope and other instruments. A student of an agricultural college has gathered all the Ashfield rocks and minerals and taught geology. He has gathered cabinets of the local animals, birds, eggs, butterflies, and insects, which a summer resident makes a basis of some instruction. A summer boarder was drafted in to teach drawing to all comers half a day per week. This experiment, in what I consider co-operative education, begins at home, with what is nearest and often despised. The local Faculty about the teacher give but little time, but their teaching is full of interest and stimulus. They strengthen the teacher whom they really guide, and bring home and school nearer together. This new curriculum is without expense, and altogether may prove a suggestive novelty. To-day old domestic industries of the age of the tinder-box and stone milk pan and niddy-noddy are taught by a specialist to history classes from the city schools in turn, by Miss H. B. Merrill, in a central museum of American antiquities in Milwaukee.

IDEALS OF A GROUP OF GERMAN CHILDREN.

By Henry H. Goddard, State Normal School, West Chester, Pa.

The following study is offered as a contribution to the growing literature on children's ideals. It is, so far as the writer knows, the first extended study on this subject "made in Germany." It is of special interest because it enables us to compare American and English ideals with those of children not only of different nationality and language, but educated under a radically different system, and all belonging to the same social class.

The material was collected by the writer in Göttingen in January, 1904.

The test was the one used by Earl Barnes and others. As we translated it, it read in German *Welcher Person (unter denen, die du gesehen oder von denen du was gehört oder gelesen hast) möchtest du am liebsten ähnlich sein? Warum?*

The teachers were carefully instructed how to give the test, and responded with the intelligence, faithfulness and carefulness for which they are famed.

Göttingen schools are among the best in Prussia. Altogether it would seem that the material is about as satisfactory as one could desire, except that there is not quite enough of it. This defect results from the timidity of the directors of two schools. They took the questions but failed to get the answers. It has been shown by experiment that 100 papers of each age of each sex is the most satisfactory number. Our material is short in only one or two points.

The material has been carefully worked over and classified, mainly on the lines laid down by Earl Barnes in his "Type Study."

Table I gives the results. The figures are all percentages, except, of course, those giving the number of papers.

Sex Differences.

Our study shows no sex difference in the choice of acquaintances. This is interesting in the face of the fact that other studies, both American and London, have shown a decided difference in favor of the girls. The peculiarity is probably to be explained by the fact that German boys choose father and uncle as their ideal much more frequently than Americans do, and more frequently than the girls choose mother and aunt.

TABLE I.

Classification of answers with percentages of each age in the respective classes. Upper line boys; lower line girls.

Ages		6	7	8	9	10	11	12	13	14	Total
Number of papers	B		120	99	131	124	103	97	103	64	841
	G	23	38	76	135	84	122	101	108	62	749
Acquaintances	B		70	62	59	46	37	27	21	37	47
	G	61	58	75	61	48	29	36	42	33	47
Father or Mother	B		58	34	36	22	12	10	4	14	25
	G	35	29	33	17	16	12	15	17	10	18
Other relative	B		6	15	23	12	11	10	9	21	13
	G	17	11	13	18	9	7·5	9	6	12	10
Other acquaintance	B		6	13	8	12	14	7	8	2	9
	G	9	18	29	26	23	9·5	12	19	11	19
Public Persons	B		2	19	23	39	46	57	62	53	35
	G	0	14	11	14	27	24	32	35	29	23·5
Emperor or Empress	B		2	17	16	20	16	12	7	3	12
	G	0	3	10	9	12	10	7	9	3	9
Historic German	B		0	2	7	19	28	37	47	42	21
	G	0	11	1	5	11	11	22	23	23	12·5
Historic Foreigner	B		0	0	0	1	1	7	8	8	3—
	G	0	0	0	0	4	3	3	3	3	2
Character from Fiction	B		0	2	4	6	6	7	6	8	4
	G	0	0	0	3	9	8	14	7	27	8
Religious Persons	B		3	14	8	6	8	4	8	3	7—
	G	22	26	8	9	16	26	13	16	14	15
God	B		1	1	0	0	1	2	2	0	1—
	G	9	11	0	1·5	0	1	0	0	0	1+
Jesus	B		2	9	5	2	3	2	6	3	4
	G	13	15	8	5	13	8	4	3	5	7
Persons from Bible	B		0	4	2	4	4	0	0	0	2
	G	0	0	0	2·5	2	17	9	13	9	7
Opposite sex chosen	B		33	13	16	11	9	6	1	1	12
	G	35	58	26	27	44	31	38	23	33	33
Not answering	B		31	3	0	3	4	5	3	0	6—
	G	17	2	6	13	0	13	5	0	0	6+

In fact, this is so marked that the boys would far outrun the girls in the choice of acquaintances were it not for the fact that

girls choose many schoolmates. Reference to Table I, under "other acquaintances," shows in the total, 19% for girls to 9% for boys.

When it comes to "Public Characters" the boys lead by about 12%, which agrees with other studies. This difference is explained by noting that girls choose more characters from fiction and more religious characters than boys. These two groups are not included under either "Historic" or "Acquaintances."

Girls choose twice as many "Religious characters" as boys. Does this not offer substantial support to the view that woman is more religious than man and that the difference is fundamental since it manifests itself thus strongly in childhood?

The opposite sex is chosen much less often by girls than is the case in other studies. Of this we shall speak later.

The same percentage of boys as of girls fail to answer the question at all.

Peculiarities of Development.

If we now examine the data for evidence of the expanding of the personality as shown by the growth from acquaintance to public character ideals, we are impressed by the slowness of the change.

The acquaintance choice starts with 66 at seven years of age and ends with 35% at fourteen. In other studies the curve has dropped to 35% at age ten; and at age fourteen it stands at 7%. The following curves show this graphically:

Acquaintance Ideals.

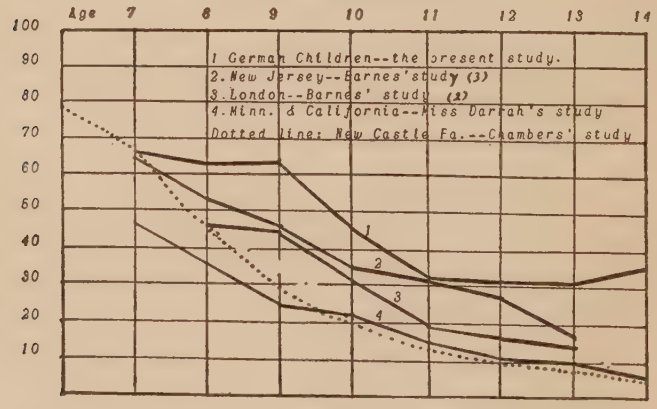

Fig. 1.

Just as the acquaintance curve starts higher and falls more slowly than in any of the other studies, so the curve of "Historic and Contemporary Ideals" starts lower and mounts more

Historic and Contemporary Ideals.

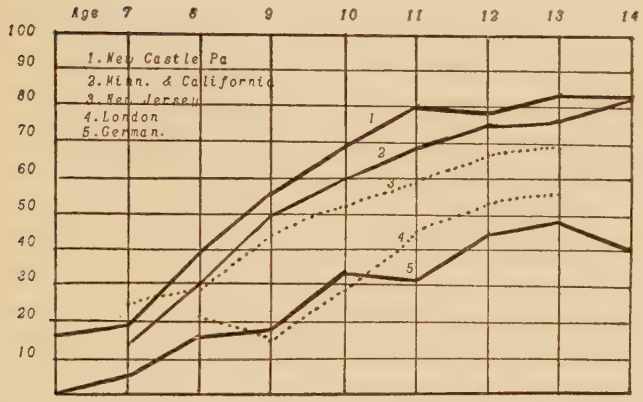

FIG. 2.

slowly than any of the others. Indeed the difference is startling! Beginning with no public characters at six years of age, we find 4.5% at seven, 48% at thirteen, and 40% at fourteen. All of the American studies are above this at nine years, while at fourteen two of them are above 80%—twice the German percentage. Of 1,600 children (nearly) in these schools less than 21% choose as an ideal a great and famous man either of the present or the past—not counting Bible characters.

It must not be forgotten that we are dealing with children of the lowest classes with whom the struggle for existence is the principal thing. On the other hand they have had eight years of schooling under excellent teachers.

Göttingen itself is by no means wanting in historic associations that might suggest ideals, but they are almost without effect. The old city wall has been converted into a beautiful promenade shaded by lindens. At a point in this promenade, which is passed every day by hundreds of these children, is the house in which Bismarck lived while in Göttingen. A tablet over the door states the fact. Up on the hillside where all Göttingen goes for its airings on Sunday, extends a large and beautiful park. In this is a great "Bismarck tower," from which a view of the whole city is obtained. In another direction is the "Bismarck Säule," a stone platform surrounded by eight massive columns which are surmounted by huge iron cauldrons, in which great fires are built on the anniversary of the great statesman's birthday. In spite of all this, Bismarck is the ideal of ten boys and two girls out of 1,590 children.

Göttingen has a University of 1,200 students. It appears to have not the slightest influence upon the ideals of these children.

A little park which forms almost a thoroughfare for many of these school children contains a conspicuous monument to the mathematician Gauss and W. E. Weber, who discovered and operated a telegraph line in Göttingen before Morse operated his in our own country. There is a statue of King William IV, one of Woehler, of G. A. Bürger, the poet, and others of less importance. Not one of these is mentioned by our children.

A study of the curves Figs. 1 and 2, suggests that possibly we have to do with something deeper than environment. In Fig. 1 it will be seen that the London curve keeps company with the German rather than with the American. In Fig. 2 the striking parallelism between the London and the German again connects the two.

Is it not perhaps a question of the old country versus the new? Like old people they are content with their immediate circle of friends. In America all is relatively new and the whole spirit of our civilization is that of unrest, reaching out after new things and new people. The school children partake of the spirit of the country. Possibly Minnesota and California in comparison with New Jersey and New Castle, Pa., may show the same thing. But, of course, we must have more studies in order to be convinced that there is this difference between the East and the West in our own country.

Again, may the feeling one has abroad be a true feeling when it seems that the European is self satisfied, contented with his immediate environment and acquaintances, does not care to know about men or matters afar off? In America, when a strange place or person is mentioned, the first question is, "Where is it? What has he done?"

This feeling that we are here dealing with a unique group is intensified by a perusal of the list of persons chosen as ideals by the German children in the "Historic and Contemporary" group. Bible characters are not included.

The following are chosen by both boys and girls. The figures in the first column are the number (not per cent.) of boys, and the second, the number of girls naming the person.

	B.	G.
Emperor William	100	20
William I	23	5
Luther	20	17
Frederick the Great	17	3
Bismarck	12	2
The Great Elector	3	2
Socrates	2	1
Goethe	2	1
Gustavus Adolphus	2	2

	B.	G.
Ludwig Richter	1	4
Diogenes	1	2
Frederick III	1	1

The following are chosen by boys only:

Siegfried	12	Frederic II	2
Blucher	12	Francke	2
Armien	8	Wallenstein	2
Frederic William	8	King of Saxony	1
Charlemagne	7	Reuter	1
Capt. Schill	6	The Pope	1
Pickart	5	Emperor Louis	1
Schiller	4	The Crown Prince	1
Andrew Hofer	4	Falb	1
Prince Henry	4	Tacitus	1
Zieten	3	Prince Eugene	1
De Wet	3	Botha	1
Tilly	2	Boniface	1
Tell	2	Alexander the Great	1
Sabuski	2	Alaric	1
Roland	2	Jansen (the explorer)	1
Theodore Korner	2	Ludwig Wetsel	1

The following are chosen by girls only:

The Empress Augusta	38	Frederick Barbarossa	1
Queen Louise	43	Queen Elizabeth	1
Hannibal	4	Frederick the Wise	1
Goethe and Schiller	2	Queen Henrietta	1
Werner von Kiburg	2	Duke of Schwabia	1
Jungfrau von Orleans	2	Pestalozzi	1

Chambers (4 p. 109) gives the names of all those mentioned by a half of one per cent. or more of the children. There are fourteen in the boys' list and fifteen in the girls'. In the foregoing lists fifteen of the names chosen by boys are above the half-of-one-per-cent. mark, but only six of the girls.

The Emperor leads, but has only 12% of the boys and less than 3% of the girls. George Washington has among the New Castle children 34% of the boys and 24% of the girls. Even McKinley has 7% of boys and 6.5% of the girls.

Whether German children love strangers less or acquaintances more our study does not show. But a comparative study of the "acquaintance" curves shows the same condition of things as above indicated:

The choice of father and mother is, age for age, from two to four times higher in Göttingen than in New Jersey. "Other relatives" and "other acquaintances" are about the same as

American. Germany is, indeed, the Father- (and mother-) land.

However we may account for the curves, it is clear that this curve goes with a condition of things with which we in America have no sympathy. Thus we get something that helps us toward a standard. If we do not yet know what is the best rate of expansion of the child's personality, we can at least see that as we approach the rate represented by these Göttingen curves we come to a condition of the narrowest sort of life, limited horizon, in short a personality wholly unfit for life in a Republic.

In Germany it is well enough—at least it fits a paternal government and is so logically the outcome of their educational system that the only inference is that they are getting what they want. As one teacher in Göttingen told the writer, "You see these girls will all be market women or shop girls and they only need enough arithmetic to enable them to make change."

The danger of a narrow utilitarianism is not that it does not provide for the livelihood of the individual, but that it does not provide for the expansion of his personality, the growth of his ideals, the complete development of his soul.

Surely we have not done our duty by the child, or by the state of which he will be a citizen, until we have brought him into contact with the greatest souls that have appeared among men. Not every child will be quickened by such contact, but as long as we cannot predict which one will be quickened, it is wise as well as just to give every one the opportunity.

Barnes (2) found 6% of boys and 8% of girls choosing writers —Longfellow leading. Among these Göttingen children six boys and two girls name Schiller; two boys and three girls name Goethe; Tacitus is named by one and Theodore Korner by two boys.

Little attention has been given as yet to fiction as a source of ideals, but the indications are that it is not important. Barnes (3) finds less than 2% of boys and a little over 2% of girls influenced by it (including myths and fairy stories).

In Göttingen Siegfried holds quite a place among the boys, and Dorothea—from Schiller's Hermann and Dorothea—among the girls. When these are taken out, there is very little left.

When the value of fiction comes to be investigated these facts must be taken into account. Considering the amount of fiction read, it furnishes surprisingly few ideals. Apparently there is a certain unreality about it all that makes children regard it as a mere plaything and not as something to be seriously imitated. Perhaps they are too near the time of their own imaginative

stories to take stock in anything that is not more accurately dated than "once upon a time."

Whatever be the explanation, the fact remains and goes a long way toward convincing one that much time is wasted on the modern novel—especially by the young.

Religion.

Prussia prescribes three hours a week for two years and four hours a week for five years for instruction in religion. One of the chief motives in collecting the data for this study was the desire to see what influence this had on children's ideals.

In American studies Bible characters and Deity play a very small part in children's ideals. Public schools taboo the subject and there is nothing left but Sunday School and the home —both of which seem to be inadequate.

The following table gives the data on this subject from all the available studies:

Table II.

	God		Jesus		Bible Hero		Total	
	M	F	M	F	M	F	M	F
New Castle, Pa. (4)	—	—	—	—	—	.5	2.6	2.7
Minn. & California (1)	5						5	
New Jersey (3)	—	—	—	—	0	—	4	4
Edinburgh (4)	—	—	—	—	—	—	7	13
London (2)	—	—	7	14	—	4	7	18
J. Friedrichs' (5)	0	0	1	1	10	9	11	10
Göttingen	1–	1	4	7	2	7	7	15

The Table appears ragged because not all students have analyzed the data on this point; however, a glance at the totals shows that America stands by itself with its largest choice at 5% for God, Jesus and Bible heroes combined.

As we cross the Atlantic we jump at once to 7% with an upper limit of 18%. This difference accords with the difference in attention given to the subject in the schools so far as Europe and America are concerned. But when we analyze the European studies it does not go so smoothly. Friedrichs's study is based only on two classes aged 11 and 12, and is, therefore, of no use in comparison, since these may well be years of greatest interest in the subject.

London children devote half as much school time to the Bible as the German children, and yet they equal the choices of the boys and surpass those of the girls. Does this indicate that a half hour is better than an hour of religious instruction?

One gets the impression that this may be the case, after a visit to the recitation where the children get very restless before the hour is over; also from personal inquiries of the children, since they almost invariably answer that they do not like the *religion Stunde;* and from a statistical study, not yet published, on the study liked best and the one liked least. While religion is seldom mentioned as least liked, it is nevertheless almost never the best liked.

On the other hand, that the difference between London and Göttingen in this respect may be a difference in emphasis or method of instruction is perhaps indicated by the fact that the Göttingen study shows many more Bible heroes and fewer choices of Jesus. Indeed the German studies are unique in the number of Bible heroes. Friedrichs (5) gives 10% for boys and 9% for girls, while our own has 2% and 7%.

The following list gives the characters chosen and number of each:

BOYS.		GIRLS.	
David	6	Ruth	21
Abraham	4	Jonathan	16
Peter	2	David	8
John	1	Mary	3
Joseph	1	Hannah	1
Jacob	1	Moses	1
Samuel	1	Peter	1
		Samuel	1

In this connection it is interesting to note that in a study on these same children, of "What person do you most wish not to be like?" 20% of the boys and 15% of the girls name Satan or some character from the Bible, which seems to indicate that Bible characters are used more as warnings than as ideals. Taken together, these two studies surely indicate that the time given to study of religion is not without effect upon the ideals of German children.

Opposite Sex Chosen.

Earl Barnes has called attention to the fact that girls choose male ideals to an extent that seems undesirable. German children do the same thing, though to a less extent. Whether they have more women to choose from it is difficult to say. They have their empress, queens, duchesses, etc., but they do not have the literary women, social reformers and college women that we have in America. A study of the curves and list of persons chosen may help us.

Here again, we note that the European curves are by themselves. The American curves are all higher and their trend is

Girls choose Male Ideals.

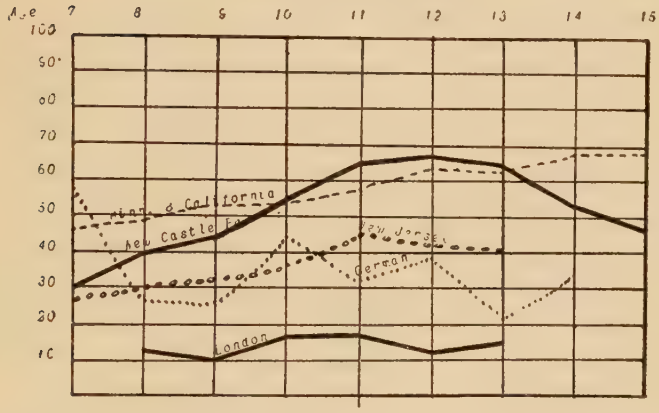

FIG. 3.

upward: the foreign curves are lower and the German one tends downward, while the English is down throughout.

An examination of the names of women that are chosen shows them in three groups as follows:

HISTORIC		BIBLE		MYTH OR FICTION	
Queen Louise	43	Ruth	21	Gudrun	2
Empress of Germany	38	Mary	3	Queen Griselda	1
Queen Elizabeth	1	Hannah	1	Krimhilde	1
Queen Henrietta	1			Princess Goldhair	1
Jungfrau von Orleans	2			Washfrau	1

Is it not significant that they find as many different persons among heroines of fiction as in history? It is encouraging that Queen Louise, the Empress, and Ruth head the list. But the vote ought to be much larger. Not enough women are available, and we do not lay stress enough on the womanly qualities of those that are available.

MITTELSCHULEN VERSUS VOLKSCHULEN.

Most valuable results could be obtained from a careful comparative study of these two schools. As the reader will remember, the Mittelschulen are attended by the children of parents who are able to pay some tuition but do not expect the University to be within their reach. The Volkschulen, on the other hand, are attended by those of the very poorest class, who cannot afford even ten dollars a year. In Göttingen the former are attended by the children of the small shop keepers, while the latter are attended by the children of the day laborers. The social differences and distinctions as well as the environ-

ment and general intellectual status are quite marked. The schools are adapted to their clientage.

Unfortunately our data are not extensive enough to allow of a satisfactory study. When we divide it into the two groups the number for each age is too small for us to draw sure conclusions. The data are approximately evenly divided between the two schools.

One of the most noticeable things in the comparison of these schools is the large percentage of Volkschule children that choose the Kaiser—19% of the boys and 16% of the girls as against 6% and 2% of the Mittelschule pupils. This seems to be quite in agreement with the well-known fact that the more immature the mind the more it is attracted by mere notoriety, pomp, parade, and show. With no disparagement of what the Emperor really is, he is little more than that to *these children*. The value of this state of affairs to the Emperor is clear.

More acquaintances are chosen in the Mittelschulen than in Volkschulen—in the ratio of 53% to 41%. This contradiction of what one should expect is probably due to the large vote for the Kaiser, who, while counted as a "public character," is so to speak both a public character and an acquaintance—his name being a "household word."

Foreign persons are chosen five times as often by Mittelschule as by Volkscḧule children. The higher group has the broader outlook. They have more history in their schools than is found in the lower schools.

Fiction is the same with the boys of the two schools, but Mittelschule girls choose three times as many ideals from fiction as do Volkschule girls.

The lower schools choose Bible heroes rather than Jesus in the ratio of 14:1. The upper choose Jesus instead of Bible heroes 12:2.

Twice as many Volkschule children fail to answer.

On the whole these facts conform pretty well to what one feels to be the difference between the two groups.

Reasons for Choice.

A tabulation of the reasons given for the choices gives the following result:

Sex differences are most noticeable in "material possessions" and "power to do things." Boys lead in both, the ratio being 14:5 in the former and 6:1 in the latter.

Comparing with other studies we find that Barnes's N. J. (3) study gives for "Material possessions" 7% and 2%: Chambers (4) gives 6% for boys and girls combined. Perhaps this higher percentage for Göttingen comes from the fact that these children being all from the poorer classes know more of the hard-

TABLE III.

Classification of Reasons with percentage of each age in the respective classes. Upper line boys; lower line girls.

Age		6	7	8	9	10	11	12	13	14	Total
No answer	B	—	31	3	0	3	4	5	3	0	6—
	G	17	2	6	13	0	13	5	0	0	6+
No reason	B	—	43	16	9	8	5	8	8	3	17
	G	52	30	15	1	4	0	2	5	0	15
Good and kind	B	—	16	34	31	30	16	13	6	9	20
	G	17	37	54	44	29	23	17	17	12	28
Material possessions	B	—	4	22	26	14	13	7	11	6	14
	G	5	9	12	7	4	2	5	0	1	5—
Qualities of character	B	—	4	16	17	32	34	40	43	60	30—
	G	0	9	7	22	44	57	65	63	74	43
Physical condition or appearance	B	—	2	6	9	8	12	9	1	8	7
	G	0	0	5	12	16	3	4	6	9	7
Intellectual or artistic	B	—	0	4	3	2	3	3	2	5	2
	G	0	0	1	1	3	2	2	2	3	2—
Power to do things	B	—	0	0	3	5	11	12	12	9	6
	G	9	13	0	0	0	0	0	0	0	1

ships that come from the want of money than do the average American children. Barnes's London study supports this view.

Power to do things is given by the N. J. children 17% and 12% by boys and girls respectively—an enormous increase over Göttingen. Personal appearance—7% of all cases—is double either Miss Darrah's (1), or Barnes's (3), and three times Chambers's (4).

"Qualities of character" in our study includes—in fact is largely made up of—bravery in war. In spite of this it is one-fourth lower than New Jersey.

"Intellectual and artistic" run as follows: N. J. 7%, New Castle, Pa., 5%, Göttingen 2%.

Here, again, we find that at every point this group is inferior to the average American group, as, indeed, we should expect it to be.

Inasmuch, then, as these figures give us the situation for a group of children of the crudest life and narrowest environment and the least efficiency as citizens, we certainly have established a lower limit which we must regard as the danger line for American ideals.

A comparison of Mittel- and Volkschule children shows only

one thing sufficiently striking to be significant. The "intellectual and artistic" qualities are named practically entirely by Mittelschule pupils.

Conclusion.

1. This group of German peasant children suffers by comparison with the groups of American children studied. This difference may be accounted for partly perhaps by the conservatism characteristic of an old civilization, but more probably by the fact that we have a strictly class group, and that the lowest socially, with no mixture of children from the more cultured or well-to-do families such as characterize the American studies.

In either case the conclusion is inevitable that the curve of these children is at least the limit, and probably much lower than is desirable.

2. The instruction in religion in the schools has a noticeable effect upon the children's ideals, though perhaps not in proportion to the time devoted to it.

3. In spite of an environment in which empress, queens and duchesses figure, the German peasant girls choose male ideals to a very considerable extent, though in a decreasing ratio.

4. We need studies on boys from the gymnasium and girls from the Töchterschulen to give us the curves of groups at the other end of the social scale.

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The studies with which comparisons are made in the foregoing pages are:

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4. Chambers, Will G. The Evolution of Ideals. *Ped. Sem.*, March, 1903, Vol. X, pp. 101-143.
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This last is a study of 344 children of the ages 11 and 12. It is not stated of what school or what kind of school. There are girls and boys, Protestants and Catholics. The material is analyzed with great minuteness and 22 tables given.

For a Bibliography of the general subject see No. 4.

SOME PHASES OF THE INTERNAL ORGANIZATION OF STATE NORMAL SCHOOLS.

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This is a study of state normal schools only, and does not include either city or county normal schools or departments of education in colleges and universities. The purpose of the study is to determine the attitude of the normal schools towards the work which differentiates them from other schools, and to take note of their internal administration as directed towards this work. This paper is based upon an analysis of the catalogues issued by those institutions as their declaration to the public of the work they do, and upon replies over the signatures of the principals to questions sent them regarding certain matters upon which the catalogues are silent. It must be said that the catalogues are silent upon several things concerning which the public would like to be informed. Many of these publications are issued without indexes; some have neither index nor table of contents, and a few normal schools issue no catalogue. The absence of an index makes it rather difficult to find the items desired, especially in those catalogues which lack logical arrangement of matter.

The total number of schools studied is 95. All of these state, in more or less general terms, what they conceive to be the function of a normal school. One of the clearest expositions of this function is found in the catalogue issued by the California State Normal, at San Francisco. The principal has further developed the idea in his report to the Trustees in June, 1903, and in a paper on "Factors in the Preparation of Teachers," read before the Association of California State Normal School Trustees, in April, 1905. The general tenor of all the definitions of the purpose of state normal schools is, that they exist for the making of teachers, and some of the catalogues set forth with a degree of explicitness what constitutes a teacher. In very few cases is a standard set up with sufficient exactness to serve as a measure of the man or woman who is to teach. In order to have a definite standard of measurement the writer of this article proposes five elements whose happy blending makes a teacher: (1) sound health, (2) *personality*, including character and culture, (3) some capacity for public

leadership, (4) scholarship, (5) professional skill and technical knowledge.

The analysis of the catalogues reveals nine states (California, Indiana, Louisiana, Massachusetts, North Dakota, New York, Rhode Island, Texas, Wisconsin) in which health is one of the conditions of admission to the normal schools. Three states (Colorado, Tennessee, Washington) suggest health as highly desirable in those who would teach. A few others make general allusions to health as one of the teacher's assets. That health is not made one of the conditions of admission to all normal schools is doubtless not the fault of the schools but is due to a lack of appreciation on the part of the public of the necessity of guarding children against the dangers—physical and other—growing out of daily association with unhealthy teachers. A large majority of the normal schools, however, safeguard such health as their pupils have on entering and develop and strengthen it by physical training.

The element of personality, although the most important of all, and most necessary to the success of the teacher, is not susceptible of immediate test, and cannot be made an entrance requirement. The most that any normal school can do is to sift out the unfit personalities after a term of observation sufficiently long to enable the authorities to reach an approximately just judgment. It is evident that such a sifting of personalities as is here suggested is a very difficult and delicate matter, and must often result in a clash with public sentiment. Naturally, therefore, few schools undertake it with definite directness. The San Francisco state normal puts especial emphasis upon the element of personality, and carefully sifts its pupils with reference to it. The judgment of the faculty as to the personality of a pupil is reached usually within six months after the pupil enters, and if adverse the pupil is earnestly advised to withdraw, but is *not dismissed*. The value of the teacher's personality is strongly urged in Rhode Island, Washington, Wisconsin; somewhat less strongly in Colorado, Connecticut, Idaho, Massachusetts, Michigan, Minnesota, Montana, and North Dakota.

This question of personality is one of several points of frictional contact between normal school advocates and normal school critics. It is claimed by the latter that "the teacher is born and not made." Normal school advocates admit that the most successful teachers are born to be so—just as is true of the best blacksmiths, lawyers, or preachers—but they claim that none is so well born that some "making" will not be of great help. Let it be agreed, as a compromise, that the best teachers are both 'born' and 'made.' Neither the normal school nor the college is quite consistent in the practical appli-

cation of its own view of this proposition, for, as shown above, few normal schools seem to pay any attention to the natural endowment (the *bornness*) of their pupils, while nearly all the colleges and universities have conceded the value of the making of teachers by establishing departments of pedagogy or education.

The greater number of normal schools, even if they do not sift their pupils on the basis of personality, do much excellent work for increasing the culture of the students. What may be called culture courses—courses of general lectures, concerts, seminars, etc.—are sustained by many, those of the western schools being especially excellent and varied. Capacity for public leadership is also a special endowment. A strong personality is essential to it, but there may be a strong personality without this capacity. Here, too, the best that the normal school can do is to select and cultivate. Forensic training—training in the power to "think on foot" and to deliver thought in good, clear English,—is perhaps the best possible means to the development of the capacity for public leadership. The normal schools at Tempe, Arizona; Peru, Nebraska; and Worcester, Massachusetts, make a special point of this forensic training. Perhaps other schools do similar work, but if so it is not featured in their catalogues. If it is done, its importance should secure for it especial prominence in the official publications of the schools. It is mentioned in some of the catalogues in connection with the literary societies; but it is surprising to note that some of even the best normal schools still cling to the mediævalism known as a "literary society." If forensic training is good, it should have as definite a place in the curriculum and be as subject to technical direction and instruction as is mathematics or chemistry. There is no reason why work in debating and other forms of public speaking should be left to the initiative of the students any more than the work in algebra is.

The question of scholarship—the fourth element of success in teaching named above—is another point of friction between the normal schools and their critics. The critics claim that the normal schools put too much stress, relatively at least, upon methods and not enough or none at all on scholarship. It is asserted that the normal schools should do no academic work, but should rigorously insist upon such an academic equipment at entrance as would enable them to confine themselves to professional work. A few schools (for example those at Providence, R. I., San Francisco, and some in Massachusetts and New York) methodize their academic subjects, teaching them only as incidental to the discussion of methods of teaching. The fingers of one hand are more than enough upon

which to count the number of state normal schools that have the same entrance requirements as the state university. Almost all normal schools do academic work in some form, and affirm that it is necessary to do so for several reasons, of which the following are the most cogent: (1) the necessity of providing the rural schools with teachers who have had at least some modicum of training for their work makes it impracticable and unfair to demand even a high-school academic equipment as an entrance condition (and it is to be regretted that more normal schools do not take this position with firmness); (2) for good professional work in advanced courses high-school scholarship is inadequate, because a *reciting* knowledge of a subject is quite different from a *teaching* knowledge of it; (3) those who are to be teachers need a different kind of teaching from that done in high-school; (4) a teacher "will teach as he is taught rather than as he is taught to teach," and so the teacher must be taught by a professor of teaching rather than by merely a professor of the subject of instruction.

A number of normal schools seem to have been spurred by the criticism of normal school standards of scholarship to reach up into higher academic courses and subjects to the neglect of the most efficient work in the lower. They forget, apparently, that they are selling their birthright for less than a mess of pottage, if they shirk their duty to the rural schools and become oblivious of the fact that scholarship does not so much consist in knowledge of advanced subjects as *mastery* of the field in which one's work is to be done. The capacity of a school to do advanced academic work depends upon the scholarship of its faculty. Regarding this matter the catalogues are somewhat reticent. Only 23 schools out of the 95 from which catalogues were secured give the source of the degrees carried by the members of the faculty. The principals of 74 schools responded to a request for specific information, and from their replies the following percentages are derived:

An average of 51.6% of the faculties of these 74 schools are graduates of colleges or universities; an average of 49.5% are graduates of normal schools; an average of a little more than 19% are graduates of both normal schools and colleges or universities. A comparison of four states in which normal schools are carefully fostered is interesting as showing conformity to or divergence from these averages.

State.	College graduates.	Normal graduates.	Both.
Massachusetts (9 schools)	31 7/9%	56 16/27%	10 1/18%
Wisconsin (7 schools)	52 6/7%	57 1/7%	21 2/3%

State.	College graduates.	Normal graduates.	Both.
Missouri (3 schools)	52%	45 1/3%	21 2/3%
New York (9 schools)	54%	58 1/9%	31 1/2%

In a large majority of the schools, the higher academic branches are taught both by college and by normal graduates, although there seems to be a growing tendency to put the advanced subjects in charge of college and university graduates, while the professional work is, naturally, almost exclusively in the hands of normal graduates. Friction is almost certain to result from such an arrangement. College men without normal training are usually somewhat contemptuous of the professional work of the normal school, and this feeling is apt to be reciprocated by the normal graduate who has had no college training and who sees much poor teaching by college graduates. Furthermore, to contend that the normal school should give academic instruction of its own and then to put this instruction in charge of men and women who have never been students in a normal school is to abandon some of the strongest arguments for academic work in normal schools, and comes near to yielding the claim of the normal school's right to be. Consistency could be maintained and one occasion of friction in the faculty removed by placing upon the teaching staff only those who have had both collegiate or university and normal training.

Some test of the work which a school does or is estimated to do by the public which it serves is afforded by the kind of degrees it grants and by the recognition accorded to these degrees. From a study of the catalogues of the 95 schools under consideration it appears that 16 schools grant both collegiate and academic degrees. These are in Alabama, Missouri, New York (Albany), North Carolina, South Carolina, and Tennessee. Professional degrees only are granted by 8 states, Colorado, Idaho, Kansas, Michigan, Missouri, Montana, New Hampshire, Nebraska. The school at Edmond, Okla., grants the A. B. degree only, and that for post-graduate work. Of the 95 schools, 83 enjoy the privilege of recognition for their diplomas as state or county certificates. In some cases a normal school diploma is so recognized only after a period of successful teaching by the holder of it. In 6 states the diploma of the highest normal school is a certificate of admission to the state university (in Illinois, Washington, and Wisconsin to Junior; in Michigan and Minnesota to Sophomore, and in West Virginia to Freshman). Others have the work in certain courses or in certain subjects accepted by the state university *ad undem gradum*. It seems clear that so long as the state per-

mits a normal school to do academic work it should be made the equal of similar work done by any other institution supported and controlled by the state.

Technical training, the fifth factor in the equipment of the teacher, is provided for in normal schools by their distinctively professional courses. These courses consist, in most cases, of a body of generally accepted facts in psychology, methodology, history of education, and educational economy, together with the theories supported by these facts; and a certain amount of practice-teaching the aim of which is to give skill.

All normal schools offer courses more or less full and complete on the theoretical, scientific side of the teacher's work. Very few are fully equipped for giving the pupil teacher practice in the art of teaching. A complete equipment for such work would consist of three distinct schools, each of which would serve a distinct purpose in giving the student a grasp of the art of teaching. These three schools would be, in the order named, (1) a model school, (2) a practice school, (3) an experimental school. The last of these only can rightly be called a "pedagogical laboratory." In the model school the student should be able to observe and study the best teaching that can be done by carefully selected experts. In the practice school the pupil teacher himself teaches and controls under expert direction. In the experimental school the professor of teaching and a carefully selected body of especially fit students should try to push the frontier of pedagogy a little further out. In this school new theories should be tested, old ones given a different application, and the conclusions carefully formulated and published. Upon this point it may be said, by way of suggestion, that there appears no sound reason why the experimental department of a state normal school should not have from the national government the franking privilege for its publications, precisely as the agricultural experiment stations in the several states now have. In this way even the remotest schools would get direct benefit from the experimental work of the state normal.

The normal schools studied make little or no distinction between a model and a practice school. Of the 95 whose catalogues are in hand, 89 have practice schools, and make successful service in them a prerequisite to graduation. But this requirement seems to be somewhat relaxed in several schools if the student makes an excellent record in his academic work. Any such relaxation of the requirement of good work in the practice school is, however, evidently a yielding of the fundamental principle of the normal school idea.

Some normal schools recognize the need of experimental schools and refer to their practice schools as "laboratories."

So far as can be determined from the catalogues, only two schools recognize their duty to the rural teachers in this regard, and provide *rural practice schools*. These two are the Indiana state normal school and the Monmouth, Oregon, state normal. This is a fact of such importance as to merit far more detailed mention in the catalogues of these schools than is given to it. Normal schools in West Virginia and Arizona have their students "visit" rural schools in the vicinity.

Some students of education are decidedly of the opinion that the state normal school should not attempt to prepare teachers for high school work. To deny the right of the normal school to fit teachers for secondary schools is again to deny its basic *raison d'etre*. Many normal schools offer courses amply strong on the academic side to equip men and women in the scholarship necessary for good high school teaching. But only 6 schools (of the 95 studied) offer *practice* work for high school teachers. These 6 are in Colorado, Illinois, Louisiana, Michigan, Nebraska, New York. About as many more have high school departments but seem to use them as "feeders" rather than as practice schools.

The distinctive professional work of the state normal schools focuses on the working out and application of their theory in the work of the model and practice schools. Between theory and practice there should be the closest and most vital correlation. Only 69 schools out of the 95 considered, however, give positive and unequivocal indications that this close correlation exists in their work. To make the connection most effective the teachers who teach the pedagogy of a subject should also teach the subject. So far as can be determined from the data at hand (catalogues and replies to questions) only 7 schools of the 95 have it thus. Doubtless others do also, but if so the fact is not communicated to the public.

The root difficulty with the state normal school as an institution is lack of proper support on the part of the state—using state in its truest sense as a social whole of self-governing people. Nor is lack of financial support meant, although this might well be improved. There is needed the support given by a hearty recognition of the full value which the normal school can be made to have. The major premise of the normal school syllogism has been established by law in practically every state. Further legislation should make the proposition a universal affirmative with a quantified predicate—which means simply that the state should require normal training of all its teachers. To require, for example, that after a certain date, set far enough ahead to work no hardship, every person not now a teacher must have had normal training before being allowed to teach, would strengthen and dignify the position

and work of the normal school, and would profoundly influence the public schools. No American state has, so far, had the courage to carry out with logical strictness the normal school idea. As matters now stand, even in Massachusetts, which established normal schools in 1839, only 48% of the teachers in the public schools are normal graduates.

As one phase of the struggle against this lack of complete recognition, the normal school has had to compete with the "question book." So long as the state does not require normal training of all its teachers, and so long as examinations are as they are, and any bright young man or young woman can prepare for them by spending a few hours with a "question book," it is to be taken as high testimony to the devotion of those who teach that they spend hard-earned money in attendance upon a normal school. Evil conditions are made worse by the general and discouraging inability of the public to recognize and appreciate expert teaching.

But the normal schools themselves are not without blame for failing to occupy their field more fully—for being content merely to get teachers ready for class-room work. These schools should stand for the largest possible educational service to the state. For example, it seems axiomatic that the first duty of the state normal school is to the rural schools, since about two-thirds of the total school population of the country are in the rural schools. In many states the fraction is larger. But very few state normal schools make any provision whatever for the practical training of teachers in the art of organizing and directing a multi-graded country school, and this training the young country teacher needs far more than the training in methods of teaching arithmetic or geography.

Why does not some strong, well-equipped state normal offer courses for the efficient training of county superintendents, and superintendents for township and for village and city school systems? Here is a great opportunity. Also, now, when so many institute instructors are 'called' and so few 'chosen,' the normal school could render splendid service by training men and women for institute work.

A state normal school should serve as a clearing house for educational news and reports upon educational experimentation for the whole state. It should also do much extension work. This form of service is worked out to some extent in California, Colorado, Michigan, Missouri, North Dakota.

There are many excellent special features in some of the state normals studied, to describe which space is lacking. But mention must be made of the very superior training given by a few schools both in the use of a library and in administering it for the use of pupils. A particularly full and complete course of

this sort is offered by the state normal at Emporia, Kansas. Good courses are sustained in library work in one or more of the state normal schools of California, Colorado, Indiana, Idaho, Michigan, Minnesota, Missouri, Washington, Wisconsin.

The writer has been deeply interested in the activities of normal schools as revealed by this study, and here expresses his great obligations to the schools for courtesies extended. The thought most convincingly suggested by the study was expressed by one of Germany's philosophers, and has been reasserted by the greatest English thinker:

"Erziehung ist das grösste Problem und das sch werste, was dem Menschen kann aufgegeben werden."—*Kant.*

"The subject which involves all other subjects, and therefore is the subject in which the education of every one should culminate, is the theory and practice of education."—*Spencer.*

REPORT OF THE COMMITTEE ON SCHOOL HYGIENE OF THE WORCESTER PUBLIC EDUCATIONAL ASSOCIATION.

Your committee has felt that its special function was to gather facts in regard to the practice of school hygiene in the cities of the United States with special regard to the best features proved desirable by practical experience. In the limits of a brief report it is impossible to cover the whole wide field of school hygiene, accordingly the committee has confined itself to a few important topics, as follows:

Schoolhouses.

The character of the school houses inthis country varies greatly. The best schoolhouses are almost ideal in sanitary construction and equipment and others defy hygienic laws in almost every respect. Investigations made in Boston, Buffalo, Philadelphia, Washington, Baltimore, and other cities, show that excellent school buildings are found in most of the large cities; but that many other schoolhouses are atrociously unsanitary. If it were possible to bring together the best features embodied in the different school buildings in different parts of the country, a model in almost every respect would result. This practical ideal, as we may call it, would embody among others the essential features mentioned in the following description.[1]

It is situated on a slight elevation. The soil is natural, free from organic impurities and well drained. No high buildings, noisy, dirty, or ill-smelling industries are near it. It is surrounded by large grounds containing a school garden, shade-trees, playgrounds, etc. The building is entirely of masonry and steel construction, built of the best glazed brick and practically fireproof. It is two stories high and built in the form of the letter H.

Heating and ventilation are by a combination of the so-called plenum and exhaust systems. Two hundred and fifty cubic feet of air space is provided for each pupil, and thirty-five cubic feet of fresh air suitably warmed and moistened is supplied

[1] Only those features are mentioned that are actually incorporated in some building. For more detailed account see The Ideal Schoolhouse, by Wm. H. Burnham, in the World's Work for June, 1901, pp. 866-871.

each pupil per minute. Distribution of the warm air and ventilation are ensured by exhaust fans placed near the top of ventilating shafts, and the foul air is drawn from each apartment. The arrangement of the warm air registers and the foul air outlets in each room is made with regard to the best distribution of the fresh air, in the recitation rooms the inlets being placed eight feet above the floor, usually on an interior wall, and the outlets near the floor on the same side. The main horizontal duct for warm air extends under the whole of the assembly room, and fresh air is introduced by a register under each seat, while the outlets are at the top of the room.

In the basement, besides the heating and ventilating apparatus, are storerooms, lunch room, playrooms, gymnasium, shower baths, toilet rooms, and ventilated lockers for the wraps of each pupil. The plumbing is all open, the sanitaries of the best modern style and ventilated through a special exhaust duct. The light in the classrooms comes from the left, or from the left and rear, and is regulated by curtains of neutral gray green running up from the bottom as well as letting down from the top. The ratio of window surface to floor surface is 1 to 4. All the exit doors open outward.

Especially noteworthy are the arrangements for cleanliness. The fresh air introduced to the heating apparatus is filtered through a screen of cheese cloth so that dust and other impurities are removed before it enters the fan room. The schoolrooms are really cleaned every day. There is no sweeping or dry dusting. The hardwood floors are cleaned every night by a carpet brush dipped in a special oil preparation. The oil makes the dust adhere to the brush, and in this way it is not stirred up, but removed from the room, and the floor is improved each time it is cleaned so that once a week it can be washed thoroughly without injury. Or the simpler and more practical method of using a small amount of kerosene oil with a so-called "dustless brush" is adopted. At intervals the rooms are disinfected. The furniture is wiped off with a moist cloth. The chalk dust is reduced to a minimum by the use of the best crayons and by cleaning the blackboards, and the little dust made is caught in removable troughs. Thus each morning the children come into a schoolroom actually clean. There are no free text-books used promiscuously, no slates, and no drinking cups; but on each floor is a drinking fountain where the children can drink from a continuous stream of water without the need of cups. Wire matting at the doors, individual lockers for wraps, and the facilities for bathing do much to insure clean clothing and clean children.

Some of the best features of this model schoolhouse are incorporated in the new high school building at Newport, R. I.

The building is in French Renaissance style; is built of brick with trimmings of gray granite; and is in the form of the letter H; and only three stories high, with unusually large windows.

"The feature of the interior plan is the arrangement of the rooms in suites. Three suites extend across the rear and front of every floor save the first, and consist of two classrooms and a recitation room between, with wide folding doorways connecting the three, so that in case of necessity one teacher might hear a class and supervise the study of two other classes at once."

While many of the essential features of an hygienic schoolhouse are found in Worcester, most of our schoolhouses are very deficient when compared with the recognized hygienic norms and are far inferior to the best schoolhouses in other leading cities, and no one of them presents an approximation to the ideal.

For a single example, most of our schoolhouses are deficient in light. An investigation reported by Supt. Lewis gives the facts concretely in regard to this defect. In his monthly report presented to the school committee, February 6, 1906, he says:

"I have caused measurements to be made in about two hundred of our rooms. In seventy-two of these the window space is less than $\frac{1}{10}$ of the floor surface. In other words they receive less than ½ of the light which they ought to receive. Only 42 of the 185 rooms measured meet the lower requirements of schoolhouse architects, *i. e.*, the window space at least $\frac{1}{6}$ of the floor surface. None of these rooms come up to the higher requirements, namely, that the window space should be not less than ¼ of the floor area. The worst condition was found at the Belmont Street building, where two rooms have a window space of only $\frac{1}{18}$ of the floor area. Moreover, the windows are in deep recesses in the French roof, so that the light admitted is probabably not more than $\frac{1}{3}$ of what is needed. This building has two other rooms, where the ratio between windows and floor is one to 14⅓, and eight where it is one to 12. The old building at Lamartine Street has four rooms where the ratio is one to 15, and eight in which it is one to ten."

Such facts emphasize the necessity of having all schoolhouse plans prepared by a commission of experts, as in Boston, or by other competent authority.

Health Inspection.

The practice in regard to health inspection in the public schools and care for the hygiene of instruction and the like, varies greatly in different localities. Many of the large cities have medical inspection, usually under the supervision of the

board of health. Some, like Boston, have daily inspection for the detection of contagious disease, others have periodic inspection, others little more than inspection in regard to vaccination, while some, like New York City and Cleveland, extend health inspection to matters relating to general physical condition and the like.

Specially interesting is the health inspection in New York City. "The Department of Health assigns physicians who inspect each school a certain number of times a week and exclude all children suffering from contagious disease. The work of these physicians is supplemented by trained nurses employed by the Department of Health who go to the homes of children suffering from tuberculosis or trachoma, and, where their services are required, show parents how to treat the children in accordance with the physician's directions. The schools in this way offer an excellent opportunity for detecting in their incipiency many cases of contagion.[1]

Specially helpful is the plan adopted of having trained nurses to look after the children, and in case of need to go to the homes. The work of such nurses is well illustrated by the report from New York City for the year 1904.

SUMMARY OF WORK PERFORMED BY SCHOOL NURSES DURING THE YEAR 1904.

No. of treatments to cases of pediculosis,	381,995
" " " " eye cases,	95,799
" " " " cases of scabies,	938
" " " " " " " ringworm,	14,879
" " " " " " " impetigo,	244
" " " " " " " favus,	276
" " " " miscellaneous cases,	20,593
Total,	514,724
No. of visits to tenement houses,	19,524
" " " " schools,	16,155
" " " " miscellaneous,	607
Total,	36,286
No. of children treated,	26,069

"Medical Inspectors are not allowed to treat or to suggest treatment to any child who is, or who may be, under the care of a private physician. The nurses treat only those cases who, either through poverty or ignorance, on the part of the parents, would otherwise be neglected, and the Eye Hospital and Dis-

[1] Personal letter from Supt. Wm. H. Maxwell, May 31, 1905.

pensaries care only for the same class of cases. The decision in the matter is left wholly with the parents. The rule as to non-treatment of any child able to employ a physician, is an absolute one, and infraction is dealt with summarily. On its part the Department has made it possible for the doctors of the city to treat a vast number of cases which would not otherwise have been brought to their attention, and it solicits the co-operation of the medical profession. Dates of treatments noted on school cards, and certificates of treatment of non-contagious physical defects, all are of very real help in the realization of the ideals in view."[1]

The schools under the supervision of the Department of Health include: Public Schools, Children's Aid Society Schools, Kindergartens, Parochial Schools, and American Female Guardian Society Schools.

"On March 27, 1905, a plan of great importance was placed in operation. This work has been referred to but its scope is of such magnitude that it merits more detailed attention. The object is that of obtaining a complete physical examination of each school child, and in this work, perhaps more than in any other, the Department needs and solicits the co-operation of not only the laity but particularly the medical profession. In detail the method is as follows:

"Each child is examined to determine the following points: condition of nutrition, presence of enlarged glands, chorea, cardiac disease, pulmonary disease, skin disease, deformities of spine, chest or extremities, defective vision, defective hearing, deficient nasal breathing, defective teeth, deformed palate, hypertrophied tonsils, posterior nasal growths, deficient mentality, and finally whether, in the Inspector's opinion, treatment is necessary. An accurate record of the condition of each child is kept on a card specially arranged for this purpose and, in each case where any abnormality is discovered, a notice is sent to the parents informing them of the existing condition and advising that the child be immediately placed under medical care. The child reports later to the Inspector who ascertains if treatment has been instituted, if not, a nurse visits the parents and urges the need of immediate attention.

"From the inception of this work (March 27th, 1905) to the end of 1905, 55,332 children were examined with the following results:

TABLE OF PHYSICAL RECORD OF CHILDREN, MARCH 27TH TO DECEMBER 23RD, 1905.

Total number of children examined,	55,332
No. of cases of bad nutrition,	3,283

[1] This and the following quotations are from the MS. of a recent lecture delivered by Dr. Darlington, Pres. of the Department.

No. of cases of diseased anterior cervical glands,	14,214
" " " " " posterior " "	3,047
" " " " chorea,	738
" " " " cardiac disease,	895
" " " " pulmonary disease,	600
" " " " skin disease,	989
" " " " deformity of spine,	485
" " " " " " chest,	401
" " " " " " extremeties,	498
" " " " defective vision,	16,394
" " " " " hearing	1,296
" " " " nasal breathing,	6,182
" " " " defective teeth,	18,182
" " " " deformed palate,	698
" " " " hypertrophied tonsils,	8,347
" " " " posterior nasal growths,	5,119
" " " " defective mentality,	1,210
" " " " where treatment was necessary,	33,351

One or two further illustrations will show the importance of health inspection.

Defects and Contagious Diseases.

Extensive investigations have shown certain significant facts in regard to the hygiene of young children, especially at the kindergarten and primary school age. It has been found that a large proportion of school children—one-third would, perhaps, be a conservative estimate—suffer from chronic diseases or have defects of sight, hearing, or the like. Every teacher meets these pupils and is handicapped in the work of teaching by their presence in the schoolroom.

These sense defects have been found to originate very largely in the early years of life. Defects of hearing are caused often by adenoid growths that come in the kindergarten or primary school period and are neglected. Defects of sight are probably in part due to over-stimulation of the undeveloped eye in these early years. Eighty per cent. or more of the children usually have been found to have defective teeth, and these result largely from neglect in the early years, many of the sixth-year molars being lost in the seventh year of life. Again, extensive studies indicate that over 90% of the deaths from contagious diseases such as diphtheria, scarlet fever, whooping cough, and measles, occur before the age of 10.

Contrary to popular opinion, there is great mortality from measles when this occurs in the early years of life and among the children of the poorer classes. Extensive statistics collected in the city of Munich showed that the mortality from this disease between the 2nd and 5th year, was 4.55%, while from

the 6th to the 10th year it was only .04%. These figures would indicate that if an epidemic occurs in the kindergarten period, the deaths are likely to be 40 in 1,000; whereas if the epidemic can be postponed until the primary school period, only 4 in 1,000 will die.

Dr. Meder, in Germany, in a study of many thousand cases extending over a period of from 15 to 20 years, has found similar, although not as great, differences in the mortality from diphtheria, scarlet fever, and whooping cough, as well as measles, between the early and the later grades.

Again, at this early age the brain as well as the body is growing very rapidly, and some able students of hygiene maintain that the nervous disorders of later life are due largely to lack of development at this period of the fundamental nerve centres controlling the larger muscles of the body and functioning the larger and simpler movements.

When we consider further that it has been observed frequently, although no adequate statistics have been collected, that children who begin the conventional school work, reading, writing, and arithmetic, at the age of 8 or 10, stand just as well at the age of 16 or 17 as those who have begun at the usual earlier age, common sense as well as hygiene cannot ignore the following question: If school diseases and sense defects, that so seriously handicap the school work, occur in these early years, and if the conventional school work amounts to little or nothing, what is the use of attempting the formal instruction and neglecting health?

Such facts indicate that the whole character of education in the early years should be changed and the emphasis placed upon growth, health and the spontaneous motor activities, plays, simple manual occupations, voice drill and the like. If the child does not learn to read in these early years he may have another chance, but if he contracts a contagious disease he is liable to die. If he does not learn to write, he may have a better chance, but if he loses his sixth-year molars, new ones will never grow in place of them.

Thus modern studies demand that the emphasis in the kindergarten and early primary grades should be upon health and normal development; and as a child is often liable to be injured without parents or teachers observing it, as an adenoid, for example, is likely to be passed unobserved even by intelligent parents, as eye defects should be corrected, and as contagious disease must be detected in the early stages if epidemics are to be avoided, the necessity of competent health inspection is obvious.

Tuberculosis.

The general principles of hygiene, which apply to other places where tubercular disease is to be controlled and eradi-

cated, apply equally to schools. Sunlight, fresh air and clean air, are the agents upon which we mainly rely in our efforts to prevent the growth and spread of tuberculosis. Sunlight is necessary because it destroys the tubercle bacillus. Fresh air is as essential as food to the nutrition of the body, and the well nourished body is not a good soil for the growth of disease germs. Clean air, that is dustless air, is essential also. Air impure from ordinary dust or other substances is a twofold source of danger. It irritates the upper air passages, producing a catarrhal inflammation whereby disease germs find soil better suited to their growth than is the healthy mucous membrane. Moreover, if the room is not properly cleaned and tubercle bacilli are deposited there, they form a part of the dust which flies about and may be breathed into the lungs of those who occupy it.

Therefore, schoolrooms should have a large amount of window space. They should be supplied with plenty of fresh air, and they should be properly cleaned so that the air shall not be dusty.

For the detection and proper control of tuberculosis in school children skilled medical inspection is necessary. Tuberculous infection of young children is common. But tuberculosis in children is likely to be insidious in its course and can be detected only by a trained observer. Tubercular infection of the bowels is far from uncommon in children, but the symptoms of this condition are not likely to attract the attention of the lay observer.

Again, many diseases of the joints and bones are tubercular and the symptoms they produce are obscure and may be misinterpreted. Thus pain really due to tubercular disease has often been ascribed to rheumatism or growing pains, so-called. The same is true of other ailments, either themselves tubercular, or caused by a tubercular process somewhere in the body. It is important that such cases be early recognized both for the welfare of the patients themselves and for the safety of others.

Probably most children afflicted with tubercular disease are unfit for school work and would be better off out of school. Some, however, may profitably engage in school work provided their work is adapted to their special disability. Most of the tubercular affections of children are what may be called confined. That is, the disease process has no external outlet and hence the infecting agent does not escape from the body. But children may have pulmonary tuberculosis, ordinary consumption, and so are liable to be a source of infection by their expectoration. Only a trained medical person can appreciate and act upon these various conditions.

Your committee can hardly emphasize too strongly the need of competent health inspection. On Feb. 12, of this year, the committee unanimously recommended the passage of the bill to provide for the Protection of the Health of Children in the Public Schools, now pending before the General Court. If, as seems probable, this bill passes, Worcester will be required to provide for medical inspection to the extent, at least, of testing the eyes and ears of all school children and periodic examinations for the detection of contagious diseases. It is necessary, however, that health inspection should go farther than this, and a plan like the New York system of general health inspection should be adopted.

Provision for such health inspection means, of course, increased expense, although this is not serious, but for any citizen who has children in the schools it would be hard to find a better investment. Without medical inspection parents often have to support the schools while their own children are excluded from them on account of disease, and few things are so expensive to a parent as illness in the family. The efficiency of such inspection in reducing the amount of disease is well shown by the statistics in New York City. The total number of children excluded from the schools on account of disease was, for 1903, the first year of adequate inspection of all children for contagious diseases, 65,294; for the year 1904, 25,369; for the year 1905, only 18,844. This great reduction in the number of cases of contagious disease during the three years is a sufficient argument for the wisdom of such an investment.

Cleanliness.

The best manner of cleaning schoolhouses is receiving much attention at the present day. The dust carries the bacteria, and the number of germs in the air is the scientific gauge of the degree of cleanliness. In all the large cities the janitors receive specific directions as to the manner and time of cleaning the woodwork, windows, floors and furniture of the schoolrooms. In Boston, once every ten weeks all floors are covered with sawdust wet with a solution of formaldehyde, which is swept up before it is dry, also twice every month door knobs and hand rails are washed with a solution of formaldehyde. The furniture is washed once a year with a solution of sulphonaphthol. In St. Louis the school buildings are thoroughly cleaned during the summer and winter vacations, including the woodwork, furniture, pupils' desks, windows and floors. In scrubbing the floors a 5% carbolic acid solution is used. There are also two other thorough cleansings of the schoolrooms during the year. The windows are washed on an average once a month. In New York, at least once in every week, the hand

rails, banisters, doors and door knobs, are washed with a solution of washing soda and water. The janitors, in sweeping the floors, use oil sawdust. In Cincinnati the floors are swept every day, and all dusting must be completed one hour before the session begins in the A. M. All the dusting is done with a cloth. Feather dusters are not allowed.

In Milwaukee, the floors are swept by the Milwaukee Dustless Floor Brushes. They are brushes of stiff bristles. In the back of the brush there is a small reservoir into which kerosene oil is poured, which filters down into the bristles. This brush, instead of raising the dust into the air, collects it so that very little passes into the air during the sweeping process. The schoolrooms, cloakrooms, and halls are swept every day.

Gauged by the scientific test of the number of bacteria in the air, this method is vastly superior to those ordinarily applied. This was shown very emphatically by an investigation made by the Board of Health in Milwaukee a few years ago.[1] With the oil-brush practically no dust was raised in sweeping. In one schoolhouse, with the use of the kerosene oil-brush, the number of bacteria before sweeping was 5, which was increased to 20 immediately after sweeping. "In the case of the dry broom, the number increased from 10 to 1,165; in case of the sawdust with the broom, the increase was from none to 1,320, showing that as compared with the other two methods the kerosene oil-brush raised practically no dust." Where the brush had been constantly in use for over a year the number of germs both before and after sweeping was exceedingly small. With much the same conditions the average number per sq. ft., as shown by a culture in this school, was only 5 as compared with 218 per sq. ft. in another school where no oil had been used.

In nearly all of the large cities the schoolrooms are swept and dusted every day and the dusting must be finished at least one hour before school opens. The door knobs, doors and hand rails are washed once or twice a month with some disinfectant, and the school furniture is washed with soap and water and some disinfectant solution at least once a year, and in some cities twice or three times. Feather dusters are being abandoned, and cloths wrung out of water, or of oil and water, are now used for dusting.

In our own city the rooms are swept only twice a week, and in some of the schools the rooms are swept at noon and dusted just before the children come for the afternoon session. There

[1] See Annual Report of the Commissioner of Health of Milwaukee, April, 1902.

are no directions to the janitors as to disinfecting door knobs, hand rails, or doors. The school furniture is not washed, and the windows are washed only twice in a year. No disinfectant is used, as a rule, in washing the floors, and with very few exceptions they are washed only twice a year. In the schoolrooms during the muddy season a continual cloud of dust is rising, which is kept in motion by the movements of the many pupils. Our janitors should be supplied with proper assistants, so that the schoolrooms may be kept in as healthful a condition as possible and that our pupils may not run the risk in attending our public schools of contracting diseases which might be prevented by proper attention to sanitary conditions.

Recesses.

Your committee has not attempted to cover the wide field of the hygiene of instruction, but it feels that the well recognized means of relieving the strain of school work should always be utilized. The conditions of a city school (sitting, eyes on book) conduce to a life far unlike the freedom of childhood. Digestion and circulation feel the change and reveal the fact in modifications or derangements of kidney and bowel habits.

The strain imposed by school on children has been appreciated to some degree, and a practical alleviation has been found in the recess period, prescribed in the schedule, in which the pupils are set free from school and resolvedinto bands of boys and girls. This relief is supplied on paper, but, as usual, there is a gap between plan and practice. Necessarily much must be left to the discretion of the Principals. Your committee has considered it an important matter to study the nature and occurrence of the recess period in the grades, to find to what degree it is affected by invasive influences, and to this end has secured the aid of scores of our teachers to collect records. The past winter was an open season, favorable to the recess, hence the showing will be at its best. It is hoped that this study (when completed) will contribute to an understanding of the hygienic conditions of school life.

An Urban Example of School Hygiene.

The city of Cleveland stands in the first rank as regards school hygiene. The following letter, June 7th, 1905, from Dr. Ehler, the Supervisor of Physical Training and Hygiene in that city, gives a brief description of what has been done:

"1. The Board of Health employs a District Physician for each ward in the city, a total of 26. Each of these physicians is supposed to visit each school in his district each day and to investigate the sanitary condition of the school, and to follow up all cases of ill health. Also the Department of Physical

Training includes supervision of school hygiene and sanitation. Each building is visited about once a month by the Special Teachers of Physical Training and reports are made by them concerning the hygienic and sanitary conditions of the building. Special attention is given to the question of heating and ventilation of all parts of the building.

"2. The buildings being planned at the present are believed to embody the very latest and most practicable ideas as to hygiene and sanitation. Of special note in this connection are the following:

"a. All new buildings are of fire-proof construction.

"b. Are heated and ventilated by a combination of the plenum and exhaust systems, having steam-driven fans for supplying the air and electric-driven for exhausting foul air. This is supplemented by a small amount of direct radiation under the windows of each room.

"The system is designed to supply 1,800 cubic feet of air per hour to each child in each classroom, and also to give an ample supply for playrooms, assembly room, halls, and toilets. The mechanical system of ventilation is now put in all buildings of eight rooms and over. Each room is supplied and vented independent of every other room. The fixtures for toilet rooms are of the very best iron enameled type of the highest design. All rooms have automatic regulation of temperature set at 70 degrees.

"c. As to lighting—the unilateral method is employed exclusively in elementary schools. d. School furniture now being put in is of the type designed by Dr. Cotton for the Boston schools. e. Schools in congested neighborhoods are being equipped with shower baths. f. Coatrooms are constructed so that coats and hats do not hang against the wall, and are supplied with steam heat near the floor under the hooks so that children's clothing may be thoroughly dried. Shelves of steel wire are provided for overshoes. These rooms have independent ventilation.

"In the administration of physical training special care is taken to provide frequent periods of relaxation. Physical training is conducted on every possible occasion outside the schoolroom, in the halls or assembly rooms, or out-of-doors whenever the weather permits. The exercises given are specially designed to promote organic vigor, and we have reason to believe, from reports that have been made, that there has been a decrease, on this account, of sickness among school children this year.

"4. As to the sanitary condition of the buildings, there is little fault to be found, as the Board of Education for several years has been keen to tear out defective sanitary apparatus

and to keep buildings in a clean condition. To improve all our old buildings and put them on the highest plane from the standpoint of hygiene and sanitation, a bond issue of $300,000 has just been made. Most of this money will be spent in the improvement of the heating and ventilating apparatus of old buildings, all of which will be brought up to the standard of the new buildings. These old buildings will also be improved in the matter of lighting, sanitary fixtures, desks and seats, and playgrounds. Small playgrounds are being enlarged as rapidly as possible, particularly in congested districts. Over $30,000 has been spent for this purpose this year."

RÉSUMÉ.

The practice of school hygiene in the United States varies greatly in different localities. Among features specially commendable for safe-guarding the health of children are the following:

1. Daily medical inspection for the detection of contagious diseases in the early stages, a system employed in Boston, New York, Chicago, and many other cities.

2. The records of general physical condition, as in New York City; the special studies of children, as in Chicago; and the special tests of sight and hearing, as required by law in Connecticut.

3. The system of school nurses for taking charge of cases of disease, as in New York City and Baltimore.

4. Vacation schools and the like, as especially illustrated by the plan in New York City.

5. The requirement of play-grounds and the plan of having them on the roof of school buildings, as in New York City. when impossible to have them on the ground.

6. The provisions for cleanliness, especially the use of the kerosene oil brush, as in the schools in Milwaukee; and school baths in the poorer districts, as in Springfield; and the special devices for caring for the outside clothing of the children and the like.

7. The plenum and exhaust system of mechanical ventilation in the large schoolhouses; the systems of open plumbing, and the like.

8. In large schoolhouses, playrooms or gymasiums, individual ventilated lockers, and bathrooms in the basement, and an adequate assembly room on the first floor.

9. The provision in the new schoolhouses for a large amount of light, from one side only when possible, so that the eyes of the teacher as well as of the pupil may be protected; a ratio of window space to floor space of 1 to 4.

10. Adjustable individual seats and desks used in the best

schools, and blackboards low enough for the children to write upon comfortably.

11. The instruction of pupils in the essentials of physiology and hygiene.

Recommendations.

In view of the facts presented a few recommendations of things essential to the hygienic welfare of the schools in Worcester seem legitimate.

1. General health inspection by a system similar to that in New York City.

2. Care for the health and physical development of the children in the kindergarten and primary grades as the primary consideration, and special care to avoid contagious diseases.

3. The improvement of old schoolhouses so that they may conform to recognized hygienic norms.

4. The supplying of all schoolhouses hereafter built with adequate play grounds.

5. Suitable provision for cleanliness in all schools by the best methods, especially the use of oil in sweeping, and the prohibition of all dry sweeping and the use of the feather duster.

While these and several other improvements are greatly needed, your committee feels that perhaps the most pressing need is for competent and adequate health inspection.

Respectfully submitted,

William H. Burnham, Ph. D.
Mary E. Barrell, M. D.
Frank Drew, Ph. D.
Michael F. Fallon, M. D.
Albert C. Getchell, M. D.

Worcester, May 18, 1906.

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CHILD STUDY IN GREAT BRITAIN.

By KATE STEVENS, Secretary of the London Branch of the British Child Study Association.

The child study movement in Great Britain owes its inception and much of its progress to American psychology, since the inspiration which led to the founding of the British Child Study Association was given by Dr. G. Stanley Hall, and its progress in England has been greatly aided by the leadership and generous minded help of Professor Earl Barnes.

In connection with the International Congress of Education held at the World's Fair, at Chicago, in 1893, Great Britain was invited to send representatives and, in response, funds were raised and placed under the control of the Woman's Work Committee, presided over by H. R. H. the late Princess Christian. Under the auspices of this committee, eight women teachers were selected to represent the various phases of educational work in Great Britain and to report on the work of the Congress. Among the representative teachers were the late Miss Margaret A. Clapperton, from St. Georges College, Edinburgh, Miss Mary E. Crees, Head Mistress of the Montem St. Girls' School, London, and Miss Mary Louch, from the Ladies' College, Cheltenham. During the Congress Miss Clapperton and Miss Crees attended the Child Study section, and came under the inspiring and enlightening influence of Dr. G. Stanley Hall. Miss Louch, who had meanwhile been attending the section dealing with the training of teachers, was so impressed by hearing an address by Dr. Hall that she attended the Clark University summer school the following year from which she returned, to quote her own words, "with her mind teeming with new interests and with a new outlook on education." Immediately after her return to England she went to Edinburgh, where Miss Clapperton and Miss Crees were attending the Summer School. All three were so impressed with the need for child study and so enthusiastic in regard to it that they called a meeting, gained the sympathy and help of several prominent educators and, as a result of this meeting, the British Child Study Association was formed at Edinburgh, in August, 1894. Miss Clapperton took charge of the Edinburgh section and was also elected general Secretary, a post which she filled until failing health obliged her to

resign in 1898. Miss Louch, who is at present general Secretary of the Association, with the help of Miss Beale, Principal of the Ladies' College at Cheltenham, initiated the Cheltenham Branch of the Society, became its Secretary, and actively promoted the work in that part of England until 1902, when she was succeeded by Miss Mary Chevallier, who still holds that office.

Miss Crees founded the London Branch of the Society, and was for three years its secretary, when the writer succeeded to that office, which she still holds. Other societies for child study were soon inaugurated at Newcastle, Derby, Manchester, Birmingham, Liverpool, and West Kent.

In 1898 the association, largely through the efforts of Mr. Henry Holman, H. M. I. and Dr. Langdon Downe, was placed on a constitutional basis. The affairs of the association are now managed through a central council composed of delegates sent from each constituent branch, thus securing unity of aim and centralization of results without interfering with diversity and adaptation of interests in each branch to its special environment. The official organ of the British Child Study Association is the Paidologist, founded in 1899 with Miss Louch as editor, a part which she ably filled for three years when ill-health obliged her to resign the work. It is now edited by Dr. Fletcher Beach in collaboration with Mr. T. G. Tibbey and Miss Sarah Young, of the Home and Colonial College.

A few details in regard to the London Branch, with which the writer is most closely connected, will serve to make clearer the aims and work of the association. This branch has been fortunate in securing distinguished educationalists as its presidents. Prof. James Sully was the first, and he has been succeeded in turn by Mr. Henry Holman, H. M., Inspector of the Board of Education, Dr. George Shuttleworth, Dr. Langdon Downe, Rev. J. O. Bevan, Dr. Fletcher Beach, Dr. Kimmins, Prof. Hewins, and Hon. Sir John Cockburn, Minister of Education, of South Australia, who still holds the office.

The method of work is to present each year a course of lectures by men and women recognized as authorities in the various phases of child life. For such lectures the Association is indebted to Prof. Lloyd Morgan, Sir James Crichton Browne, the distinguished alienist, Professor Earl Barnes, and recently to Dr. John Willis Slaughter, from Clark University. These lectures are free to members and open to others interested on payment of a small fee (6d).

Under the inspiration direct or indirect of Prof. Earl Barnes, to whom the Association owes a deep debt of gratitude for cooperation and support, as to Dr. Hall for the initial inspiration,

a number of individual studies have been made, most of which have been published in Earl Barnes Studies in Education or the Paidologist, though a few have appeared in other periodicals. Studies made are as follows:

BARNES, EARL. Children's Ideals. *Ped. Sem.*, April, 1900, Vol. 7, pp. 3-12. Children's Sense of Property. Read before the Association May, '99. Children's Pets. Read before the Association May, 1900.

CASH, MISS K. G. Pets; a Side Study. Barnes Studies in Ed., Vol. 2, pp. 100-111. Study on Children's Sense of Truth. Barnes Studies in Ed., Vol. 2, pp. 308-313.

CREES, MISS MARY. Children's Occupations. Read before the Ass. Feb., 1900. Children's Ideas of War. Read before the Ass. Feb., 1901.

COOKE, EBENEZER. The A. B. C. of Drawing. An Inquiry into the Principles underlying Elementary Instruction in Drawing. Special Reports on Ed. Subjects, 1896-7, Vol. 1, pp. 115-156. Eyre & Spottiswoode.

DISMORE, MISS BLANCHE. Ought Children to be Paid for Domestic Service? Barnes Studies in Ed., Vol. 2, pp. 62-70. How Words get Content. Barnes Studies in Ed., Vol. 2, pp. 41-70.

LOUCH, MISS MARY. Difference between Children and Grown up People from the Child's Standpoint. *Ped. Sem.*, July, 1897, Vol. 5, pp. 129-135. Relativity of Truth. Paidol., Nov., 1901, Vol. 3, pp. 141-155.

MARSDEN, R. E. Records from a Parent's Note Book. Paidol., July, 1902, Vol. 4, pp. 155-159.

MARSH, MISS MABEL A. Children and Animals. Barnes Studies in Ed., Vol. 2, pp. 85-99. Travelling Companions. Paidol., Nov., 1900, Vol. 2, pp. 131-137.

OLSEN, J. Children's Ideas (Denmark). Paidol., Nov., 1900, Vol. 2, pp. 128-131.

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URWICK, H. M. If you found a Shilling: a Study in Children's Property Sense. Paidol., April, 1901, Vol. 3, pp. 18-22.

YOUNG, MISS SARAH A. A Study in Children's Social Environment. Barnes Studies in Ed., Vol. 2, pp. 121-140. Delegated Authority. Barnes Studies in Ed., Vol. 2, pp. 218-226. School Girls' Ideas of Women's Occupations. Barnes Studies in Ed., pp. 259-270. Children's Travel Interest. Barnes Studies in Ed., Vol. 2, pp. 338-351. The Teaching of Geography. Barnes Studies in Ed., Vol. 2, pp. 373-387.

Circles or Round Tables for the study of special topics have also been instituted as a part of the work. Two of the most successful of these have been the one conducted by Mr. and Mrs. J. C. Hudson for parents and teachers, and that conducted by Miss Ethel Dixon and Miss James for those engaged in the study of defective children.

For the past year the London Branch of the Association has worked in co-operation with the Childhood Society, which was founded through the influence of Dr. Francis Warner as a result of the investigation of the committee for the Scientific Study of the Mental and Physical Conditions of Childhood with which Dr. Warner was connected. The report of this committee was based on the examination of one hundred thousand children. As both societies have similar aims and cover in many respects the same ground, it was felt that it would be a waste of energy and organization to continue two sets of meetings and lectures when both societies could be strengthened by co-operative work. Accordingly a joint committee, formed of delegates from the two societies, was appointed to arrange a programme. Through the efforts of Dr. Kimmins, while President of the London Branch, an active and generous co-operation on the part of the University Extension Board was brought about. A continuous three years course of lectures entitled "The Evolution of Mankind as seen in the Child and the Race" was arranged and is still in progress. The first year's course, given in 1904-1905, was in three divisions.

1. General Biology, by Dr. Chalmers Mitchell.
2. Anthropology, by Prof. Westermarck.
3. Animal Psychology, by Prof. Lloyd Morgan.

The second year's course, 1905-06, just completed, included :

1. The Physical Development of Childhood, by Miss Alice Ravenhill and Dr. Shrubsall.
2. Defective Children, by Dr. Kerr, Med. Officer of London County Council.
3. The Psychology of Infancy and Childhood, by Dr. Slaughter.

The third year's course as planned will consist of

1. The Psychology of Youth and Adolescence.
2. Educational Sociology.
3. Ethical and Moral Education.

In reviewing the progress made during the twelve years since the initiation of the movement, no rapid or phenomenal growth can be recorded. At first, the movement, when it did not meet with actual hostility was apt to be regarded by many as a fad, by more, it was treated with indifference, while a few saw in it great possibilities of reform in the more mechanical methods of dealing with the young. But while progress has been slow, it has been sure and the movement has gradually won the confidence and support of those in charge of educational affairs. The Association now numbers among its friends and adherents such men as Prof. J. J. Findlay, of Owens College, Manchester, Prof. John Adams, of London University, Prof. Lloyd Morgan, Prof. Muirhead, Dr. Chas. Myers, London

University, Prof. Sherrington, of Liverpool University, Sir Wm. Mather, Dr. F. S. Clouston, of Edinburgh, Dr. George Shuttleworth, Dr. Cecil Reddie, Head Master of Abbotsholme, Mr. Henry Holman, H. M. I., of the Board of Education, Hon. Sir John Cockburn, K. C. M. G., Minister of Education, South Australia, Prof. Patrick Geddes, Dr. Fletcher Beach, Dr. James Kerr, Dr. Kimmins, Chief Inspector of Ed. of London County Council and many others, Nor is its membership confined to Great Britain, for on its rolls are representatives from Russia, Denmark, Germany, India, and United States. The effect upon all those who have undertaken it seriously and systematically is to deepen and render more intelligent their interest in children. Through the lectures many teachers and pupils in training schools have become interested and this has resulted in a marked change of attitude toward children: the bad boy becomes a problem to be studied, a deeper insight into child nature is gained, the various stages of genetic development are beginning to be better understood. Analogies between the evolution of the child and the race are now recognized and, as an outcome of all this, there has come a greater definiteness of aim in the training of children together with a deepened respect for child nature and its undoubted rights and claims upon us.

On the side of physical development and training there has been a decided gain, as children who have hitherto been considered as hopelessly dull and stupid are now frequently found to be suffering from adenoids, eyestrain, defective hearing or some other physical defect which medical treatment can wholly remove or greatly ameliorate.

Again, there is invariably found to be an improvement in the relations of teacher and pupil, since the latter reacts to the interest and sympathy shown toward him, and also between the teacher and parents, consequent upon the interest shown in the child and his environment. No teacher who has ever earnestly studied her pupils, who has intelligently and sympathetically watched and guarded their development and sees the infinite possibilities of child nature, would ever go back to the old days of mechanical rote work, when the time of release from the monotonous drudgery of the schoolroom was eagerly awaited by both teacher and pupil. Educational conditions are steadily improving in Great Britain, and to the child study movement many of these improvements are directly or indirectly due, for with the increase of knowledge about children have come increased possibilities of meeting their needs, and training them for usefulness in the great social order in which even the humblest must bear his part.

IMPORTANCE OF COMPARATIVE PSYCHOLOGY FOR TEACHERS.

By Toshi-Yasu Kuma, Fellow in Clark University.

Comparative Psychology has come to stay. The works of Lloyd Morgan, Thorndike, Forel, Peckham, Yerkes, Lubbock, Small, Kinnaman and a few others have given to it the dignity of a science. The advent of this branch of psychology marks the latest and the highest stage in the development of the science of the mind. Comparative psychology is thus the newest branch in psychology. But it is at the same time the oldest. Or rather it is the newest because it is the oldest. This appears paradoxical but it really is not so. It is the newest in the order of development of different branches of psychology, but the oldest when considered from the standpoint of the material dealt with. In any study, the natural procedure is from the known to the unknown, or from things as they now are before our eyes to their obscure origins. Thus, in psychology, the start was made with a very practical side of the mind, beginning with the problems immediately connected with our practical life; and as the science developed and more came to be known of the mind, men became curious in regard to its origin and are now attempting to discuss it from an intelligent and scientific basis. Psychology in this last phase of development enters the realm of animal life. Here we deal with the oldest things in the psychic life, with the original stuff of the mind.

It is needless to say here that comparative psychology, like all other sciences, rests upon a fundamental assumption which it is difficult to prove. We have to assume that the mind in animals, as far as it goes, is like ours, that it operates under the same laws that govern our minds, and that it is revealed by objective manifestations as in men. Unless we grant this, we cannot talk of comparative psychology. There are some who think we have no right to make this assumption. Extremists in this camp go even so far as to say that nothing short of being animals themselves gives us any right to speak of their minds. But this assumption is, as shown by Lloyd Morgan,[1] as well as by Dr. Sanford,[2] necessary and justifiable from the

[1] Morgan, Lloyd C.: Introduction to Comparative Psychology, Chapter 3, pp. 36-39.

[2] Sanford, Edmund C.: The Psychic Life of Fishes. International Monthly, 1903, pp. 343-343.

scientific standpoint. What would become of human psychology, as anything but a solipsistic matter, if we were not justified in inferring from objective data the presence of minds like our own in other individuals? The possibility of human psychology as a science rests upon this assumption denied by some to comparative psychology. So long as psychology remains a science, the foundation of comparative psychology remains also secure.

The fact we mentioned at the outset, that comparative psychology brings us into contact with the original stuff of our minds, and that it marks the highest stage in the development of psychology, is a good excuse for its being. This is not, however, a mere theoretical justification, as might appear. There is a strong practical reason for its existence and for its vigorous study everywhere, and especially by teachers. In my opinion, there is no branch of psychology which is more helpful and important for teachers than comparative psychology in the laboratory.[1]

There are many reasons why comparative psychology is better than other branches of psychology for teachers. I wish to discuss briefly some of the most important of these. First of all here we deal with life as a whole, in contradistinction to human psychology, where the mind is studied piecemeal. When we study a monkey under certain given conditions we see before our eyes the actual reaction of a whole living organism, of a whole psychic complex; we see how instincts, emotions, and intelligence are brought together to bear upon the exigency of the situation. In other words, we find how a mind as a whole actually works when it faces a practical problem. This is vastly more valuable for teachers than the kind of psychology now commonly taught in normal schools, in which the mind is studied in different chapters, and nothing is said as to its practical working. What a teacher needs most is not the knowledge of the special mental process involved in the acquisition of knowledge, as is commonly believed, but is rather, in my opinion, the insight into the general working of the mind; not so much to know the elements of the mind as distinct factors as to be able to appreciate it as a living unit. Give him the skill to deal with the mind as a whole, his inability to analyze it into separate processes matters naught. This insight and this skill is to be cultivated, if at all, by psychological study, best of all by comparative psychology in the laboratory. Furthermore that infinite patience and sympathy which is indispensable to the success of the teacher can also be fostered by the study of animals. A rat or a chick will always act true to

[1] It has to be admitted, of course, that every branch has its own peculiar contribution to make towards the practical success of teachers.

its nature and not as we sometimes expect. In this respect animals are just like children. The loss of patience or lack of sympathy not only makes the results of experiments questionable, but often actually makes the work impossible.[1] An ordinary beginner in the laboratory study of comparative psychology will ruin many animals before he gets any valuable results. But a few animals ruined in this way would indeed be well sacrificed for the good of children who might have to serve the teacher in their stead. Surely a teacher who cannot control himself before animals ought not to have any place in a schoolroom.

The foregoing leads to another phase of the question, and that is the fact that the comparative study of psychology is the best method of introspection. Teachers must know how to introspect, or to know how their own minds act under a certain given condition. With ordinary teachers, however, it is rather a difficult task if not impossible. In their dealing with children they have a chance to see the effects of their attitude, words, and acts reflected in the reactions of children. But average teachers cannot properly evaluate the effects of their doing. They are too prone to find excuses for everything they do and to blame the children rather than themselves for everything wrong or undesirable. But let one deal with animals, and in a very short time he will find out how very impatient and how unsympathetic, and often how cruel and egoistic he is. Dumb animals act as their instincts prompt, and offer no excuses. Thus they do not provoke excuses on the part of the teacher. This creates a favorable attitude in the mind. He must persuade himself to face squarely the effect of his own act and candidly to examine himself.

In this connection we must remember, also, that in comparative psychology conditions are much better controlled than in human psychology. Mental reaction in animals is comparatively simple and the range of experience is narrow. Hence the possibility of its reactions is limited. So the chances of technical error are much smaller than in human psychology, where an infinite number of influences makes the control of conditions exceedingly difficult. This gives the former a decided advantage over the latter in bringing out the relation of the cause and effect in the psychic life in a definite and emphatic form. And this difference is important for teachers.

So far I have spoken of methods and conditions. How about the material itself? Here again we must speak in favor of comparative psychology for teachers. In this branch of

[1] To appreciate the amount of patience and sympathy needed in dealing with animals, one should read Bostock's excellent book, "The Training of Wild Animals."

psychology we deal mainly with instincts, rudimentary emotions, and intelligence, the latter mainly in the form of adaptive associations. These factors comprise the main portion of the every-day psychic activities of man. And in comparative psychology we study them in their original forms. This is important for teachers because the child is essentially a being of instincts and simple association mechanism. The higher mental structure, the problem with which the teacher is concerned, must be built upon this foundation. The important thing for teachers is to know that intelligence does not come out of nothing.[1] It must have its origin in instincts and simple associations, and it is important to know that instincts themselves are variable things, that they are adaptive,[2] and that animals with no more mental equipment than bare instincts can learn, even simple organisms like the protozoa showing an unmistakable sign of educability.[3] Thus a mere observation of the learning process in animals belonging to different stages of evolutionary development, both under controlled conditions and in their native habitat, constitutes a very important factor in comparative psychology for teachers.

This new branch of psychology, thus showing the gradual development of instincts and intelligence, gives proper perspective to the human psychology, and, above all, it gives dignity to the original psychic equipment of the child. One will come to believe that, from the standpoint of the teacher, emphasis must be laid, not on intellect or the superstructure, but rather on the instincts and simple associations which are the foundation. Give the child good, healthy instincts and his moral development will take care of itself. What is character making except training the child so that he may react properly in a given situation? And what assures this proper reaction except healthy instincts, richness of experiences or association material to give a wide range for the choice of action?[4] The possibility of deliberation, choice, and mental poise depends upon richness of association material. Education as building of character thus resolves itself into this, namely, the cultivation of healthy instincts and the enrichment of association material. Give the child all possible experiences and information. These serve him as a reserve fund upon which he can draw in cases of emergency. A resourceful man is a man with

[1] Hobhouse, L. S.: Mind in Evolution. First five chapters.

[2] Porter, James P.: The Habits and Instincts of Spiders. Psy. Bulletin, Vol. 3, pp. 44-45. This paper will appear in full in the July number of the *Am. Jour. of Psy.*

[3] Hodge, C. F. and Aikins, H. A.: The Daily Life of a Protozoan. *Am. Jour. of Psy.*, Vol. 6, p. 7.

[4] Dr. Burnham says in one of his educational lectures that the habit of reaction along many lines is important and that the possibility of self control depends upon richness of experience.

rich personal experiences as well as with a good store of information. When the child falls into a right reaction, effort should be made to make that reaction habitual and instinctive. This is hygienic as well as economical, mentally speaking. A man instinctively good and who cannot help doing good is infinitely superior to a man who does good things because he thinks they are good. A man with his lines of reaction made habitual may suffer from the limitation of his adaptive power; but this limitation will be easily counterbalanced by his experiences or association material ever increasingly enriched. Now comparative psychology shows us this original stuff of the mind, instincts, simple association mechanism, etc., in their pure forms. Herein lies its chief value for teachers.

An objection may be raised on this point by saying that this view tends to emphasize instincts and simple association processes unduly, and does not give due importance to intelligence. which being the last thing evolved in the mind must be the most important. We readily admit that intellect is the highest thing yet evolved in the mind; but we cannot agree that it is, therefore, the most important. Qualitatively it may be, but quantitatively surely it is not. Intellect independent of instincts and simple powers of association is as inconceivable as the existence of steam without heat and water. Tinkering with the intellect is not the best method of enriching our lives; we must plough deep into the subsoil of instincts and emotion. Will a perfect man, if ever such exist, be entirely intellect? We cannot conceive such a human being, however highly evolved. Christ, our ideal of perfect manhood, was far from being all intellect. His personality was teeming with instincts and emotions. The richness of his life, his perfect knowledge and supreme wisdom, were due to perfect correlation of these simple but very rich materials of the psychic life, and he never trifled with his own intellect.

So I conclude this brief discussion by repeating the assertion that no branch in psychology is more important for teachers than comparative psychology. I base this assertion on the fact that mere observation of animals teaching and imitating one another in their native habitat, or solving problems forced upon them in the laboratory, constitutes by itself a valuable lesson in pedagogy; that the study, having to deal with the fundamental elements of the mind in their pure and simple forms, enables one to understand and appreciate their nature and value, that it therefore makes one respect the native endowment of the child's mind, that it fosters patience and sympathy in dealing with "other minds than ours," that it gives one the insight and skill to deal with the mind as a whole, and that it gives all these indispensable lessons for successful teaching better than any other branch of psychology.

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Eos. Wien, 1905.

These four journals, none of which are much more than two years old, together with Die Kinderfehler (Langensalza, 1896), now in its eleventh volume, Zeitschrift für Pädagogische Psychologie, Pathologie und Hygiene (Berlin 1899), and Zeitschrift für Schulgesundheitspflege (Hamburg, 1888) mark a very distinct new educational movement in Germany which is of the utmost importance and of which few Americans have realized the full significance. They are the dawn of a new day for education in the land to which so many look for the best and most progressive educational ideals. Each represents a movement directed by a group of active workers who are far more scientific, modern and progressive than the rank and file of teachers in that or any other land.

The first of the above journals, a quarterly, is the organ of a society devoted to experimental didactics. It is edited by Professor Meumann, an eminent experimental psychologist, who has just been called to the chair of Kant in the ancient University of Königsberg (which fact of itself brings out the striking contrast between the old and the new methods of studying the human mind and of developing youth), and by W. A. Lay, the well known author of Experimentelle Didaktik, published three years ago. The ideal is the gradual establishment of the practice of education upon a solid scientific basis. In one article [1] this journal breaks almost with violence away from the old philosophical pedagogy of Herbart and Ziller, which are declared obsolete and which must all be done over again from the bottom. Thus a sharp breach has been made with the venerable school of Diesterweg, which harks back to the past and regards all systematic observation and experiment in this field as only frills and affectations. In the first number it is admitted that this movement grew out of experimental psychology, that scientific pedagogy began with hygiene, fatigue, etc., which are still so fruitful themes. Another contribution came from insanity. The technique and economy of learning has been considerably developed for reading and writing, although some of these studies are made upon adults (*cf.* Müller, Steffen, Pentscheff, Zeitler, Erdmann and Dodge, Messner, etc.). Another source is child study in the narrow sense, such as child language, rapidity of work at different hours, the relation of different topics to fatigue. The tendency to separate pedagogical and psychological experimentation is now justified. The former is more often made upon groups or masses than individuals, and upon children rather than upon adults. It has already an imposing technique, and not a few interesting questions may be said to be already definitely settled. We have no space here to describe the many interesting researches already reported in the pages of this journal, but it is suggestive that there are now some half

[1] Sallwürk: The end of the Ziller school.

dozen pedagogical laboratories established in Europe, viz., at Zurich Antwerp, St. Petersburg and Budapest, and Milan. The first was un der Meumann before he went to Königsberg, and the others are unde Schuyten, Netschajeff and Ranschburg and Pizzoli respectively. Di dactic experimentation is an exact school of science controlled by tests and statistics. It even attacks so complex problems as the methods of teaching modern languages.

The second of the above journals, by Stern, is devoted to truth in observation and description of things and events. This will seem to those who do not reflect a rather barren theme. Nearly all the studies consist in looking at a picture, a landscape, seeing a mock fight, or observing carefully and systematically for a few seconds or minutes and then immediately describing precisely what was seen or done. The innumerable errors fall into certain groups which open rich vistas for the psychologist, and if ever there was a science of ignorance and error, here it is. Not only the object-lesson method, but the very nature of testimony, and the legal age at which a child can bear witness in court, are involved, as are the relations between empirical observation and injection from subjective sources. Although these tests are often performed upon adults, the most and the most fruitful by far are upon children, and it will strike American teachers with considerable surprise to realize that this mine itself is rich enough to justify a large journal devoted to it alone.

The third of the above periodicals. the Archiv, is by far the most voluminous. Like the others, it involves a new centre here for all those interested in the biology of ethnic differences and of society and social organizations. Many of these articles have no immediate relation to pedagogy, while not a few of them are directly upon it and others are more or less connected. Such problems as colonial training, degrees of relationship, illegitimate children, the family, the relation between ethics and evolution, evolution as a proper subject for school instruction, the relation between culture and the brain, the city and country children, methods of improving the race, anthropological measurements of children, the development of instinct, etc., will suggest the vast range of this new journal.

Eos is a quarterly devoted to the scientific study and treatment of abnormal children and youth. As every one knows, accidents of development and misgrowths of mind and body and arrests are nature's experiments to be utilized by man for science on the one hand, while the best methods of instructing all the unfortunate subnormals, blind, deaf, idiotic and only slightly backward children, are also treated and so far as possible reduced to their scientific basis.

These four journals, which show incidentally how far more specialized intellectual work is in Germany than in this country, are all closely related with child study, and threaten for the future the supremacy in that line which a few years ago was very readily and cheerfully accorded to this country. No one can take and read these journals, if he has no other contact with the frontier line of advancement in science, without feeling that much of our own pedagogy is in point of fact as belated and outgrown as some of these enthusiastic workers deem that of Herbart in the fatherland. G. S. H.

Let Youth but Know. A Plea for Reason in Education. By KAPPA. Methuen & Co., London, 1905. pp. 256.

This unknown author assumes, with Sir Joshua Fitch, that "education is a progressive science and at present in a very early stage of development." The undergraduate to whom the work is addressed is heavily loaded with dead knowledge. He has given him a treasure casket with no key to unlock it. His best years were portioned out

between dead task work and ideal child's-play sports. He knew nothing of the political or spiritual history of his country, his school or his university. He was suffering from mental dyspepsia "as a result of the meal of chaff we serve out week after week; we collect it, we chop it up, we tie it up in packets; we spend hours in administering it in teaspoons and this is the end." Thus he characterizes the course of the English classical schools which takes in brisk, healthy boys of fair intelligence, and rather disposed to work, and sends them out young gentlemen who know nothing of the world about them, "can do nothing and are profoundly cynical about all intellectual things." The end of education is to realize the miracle of existence "in all the manifestations of the great Thaumaturge," which has flung immensity to us. Will the educators be able to justify themselves in the day of wrath? We should teach life lore. Every school should have a telescope. History should be made a romance and not a drill; so should religion, which is its outcome. Christianity is not simply a picturesque adventure of the human spirit. The average boy leaves the public schools a heathen. This is a calamity for his virtue, his efficiency and his happiness as well as a danger to the State.

We are now world citizens and we ought to have personal relations, sympathetic or sinister, toward the great characters of the present as well as of the past. Stimulus is far more important than exactness. Of course there must be some time deliberately set apart for drudgery. No language, at least save French, should be taught until a boy knows history or something else which makes him long for the contents which modern languages contain. The time from seven to thirteen should be divided between history and science, both of which should seek to awaken the imagination, arouse wonder and awe. At thirteen he should choose between them, and if he decides for history he will also decide for "its breath and finer spirit, literature." Grammar is a great fetich. For those who live on a plain and want to reach a hill there must of course be a road at the base. Higher up it will become a track, later a path, and higher up each must find or make his own way. Our pedagogues, however, want everything on a macadamized road. Translations are generally verbal chess playing. Heine says the Romans conquered the world because they did not have to learn Latin, the Esperanto of the middle ages. Classics do give a sort of suppleness and ingenuity, "which accounts for the number and excellence of our writers of elegantly playful verse." If we look at the classics in their true perspective we should be content with translations for prose where the matter is everything and the manner less, where we should read not slow but fast. We can feel a good prose writer's style, if we once know it in a good translation, almost as delightfully as in the original, but in poetry some vital essence is always lost by translations. Boys should not take wisdom on trust. They should read critically, but nothing to which their powers of criticism are wholly unequal.

In defense of athletics it is often said that they furnish good topics for discussion. Between seven and twelve a large part of a boy's work, now, alas, has to be sheer drudgery. The spirit of athletics favors bullying. Just as an electric current orders iron filings, so does an ethical spirit order the facts of nature and history. No period is so pregnant with momentous issues as the present. Boys appreciate keenly Leech's Comic History of England because they like to see its commonplaces made ridiculous. In Fredrika Bremer's novel, "Neighbors," two school-girls fight a duel in behalf of their heroes, Charles XII, and Peter the Great. To-day they would care for nothing but marks. True science is true religion or at least they are twin sisters,

and their separation means the death of both. Science prospers exactly in proportion as it is religious and *vice versa*. The danger of our education is the development of a type. Boys with literary tastes ought to associate. The Duke of Wellington never used the phrase about Waterloos being won on the playgrounds of Eton. On the contrary, most great soldiers have been great leaders.

Poverty, by ROBERT HUNTER. The Macmillan Co., New York, 1905. pp. 382.

The chapters in this very important book are poverty, the pauper, the vagrant, the sick, the child, the immigrant. The city waif is incapable of sustained effort or care for the happiness of others and often has a perverted love of adventure. In many vicious districts home life has completely collapsed. Thus the children are brought up on the street. Most of their so-called petty crimes are, at first, only expressions of the spirit of adventure. If the city has any responsibility in this matter, then it can be justly accused of making thieves, and then punishing them. The children of immigrants pick up our ways and speech long before their parents do and therefore come to feel themselves far superior to their elders for whom they often act as interpreters and instructors. Hence parental advice is despised. If the child earns some pittance outside, then emancipation from home influence is all the more complete. The difference between industrial conditions on the country farm and in the crowded business and tenement regions of a great city is perhaps the most extreme change to which the race was ever called upon to suddenly adapt itself.

In view of the elemental need of space it is strange that the school buildings and yards in cities are closed from one-half to two-thirds of the time between eight in the morning and ten at night. This great social plant is owned by the people, but during most of the available time they are forbidden to use it. The school must no longer be a mere dispensary of standardized knowledge. This is not education in the modern sense. The school has not realized that the home is passing away and that the entire situation has changed. Despite play centres, crime is increasing. Parents are anxious to have their children taken care of, but the desire of throwing their duties upon the public must not be mistaken for love of education.

In our slum districts, where often there are children from a dozen races, speaking different tongues, in a single class, the children may be as unlike as Caliban and Prosper. Such conditions have made it hard to fulfill even the primary responsibility of the school and have made it all the harder to assume new ones.

In New York city 14 per cent. of all the children of eleven and twelve are not in the public schools, nor are over one-quarter of the children of thirteen and more than one-half of those of fourteen.

Now in a democracy the masses will control. We must make up our minds to increase the present cost of education ten-fold and to greatly increase the efficiency and expertness of present boards if we are to cope with all impending dangers. No child ever needed education more than the child in the modern city, or suffered more where mere learning is substituted for education.

"In the South there are now six times as many children at work as there were twenty years ago." We are easily aroused to protest against atrocities in other countries. Dickens's "Borough of Muggleton" had presented at various times 1,420 petitions against negro slavery and an equal number against any interference with its own factory system at home, perhaps worse than slavery. Mrs. Florence Kelly saw more than three hundred children working in the Chicago

stock yard, "scores of them standing ankle-deep in blood and refuse," as they did the work of butchers.

Often the children displace the men and the younger children displace the older children. Wherever it exists child labor is one of the chief causes of the non-employment of adults. This, however, is more than destroying capital for it is eating up its very source. Such children drag out a life of unproductive or half productive manhood. They rarely earn living wages. Such employers, who exhaust the immature energies of childhood, are social parasites, enemies of all public and private weal. It is they who cause us to be threatened with a degenerate working class, exhausting humanity as a coal mine is exhausted. If, on the other hand, we are to attain the industrial supremacy which our early days promised, we must carefully educate the working classes. This destruction of little ones is not without kinship to cannibalism. It is hard to discuss child labor as an academic question. The worst of it is that as cities grow larger and land more costly, as homeless, yardless tenements multiply, the child problem is likely to grow more and more serious in the near future. Perhaps there is hope, however, in the present decentralizing movement which develops suburban tastes.

The Philippine Islands, by FRED W. ATKINSON. Ginn & Co., Boston, 1905. pp. 426.

Every one will be grateful to the first superintendent of education in the Philippines for putting down his impressions, experiences and knowledge, which as a point of departure will make a document of increasing value as time goes on. This work includes the general geography and history of the islands, climate, public health, commercial geography, the people, superstitions in religion, government in education. For ourselves we are especially grateful for, and interested in, the chapter on superstitions and religion which is a distinct contribution to our knowledge in some respects. We cannot but wish, however, that the author had enriched this chapter a little more by utilizing the growing, now rather copious anthropological literature of myth, custom and belief that bears upon this subject. The book is well written, the illustrations are interesting and many of them new even to those who have followed Philippine matters, and it is published in excellent style.

Primer, by SIDNEY C. NEWSOM and LEVONA PAYNE NEWSOM. pp. 127. First Reader, pp. 143. Second Reader, pp. 192. Third Reader, pp. 224. Language Lessons, pp. 208. Grammar, pp. 144. (Philippine English Series.) Ginn & Co., Boston, 1904.

Philippine pedagogy abounds in new problems, one of which is that of elementary text-books where the competition between rival publishers goes merrily on. One of the first series was by former division superintendent Gibbs, for the American Book Company. His primers and early readers were an original new departure in their abundant use of native pictures of flora, fauna, and people, with generous use of excellent colors. It was a very meritorious new departture, and the problems of adaptation were earnestly and ably grappled with. It was not realized by the earlier educators in the Philippines that they had any folklore that could be made of pedagogical value, if, indeed, they had any at all, and most of their customs were only to be eradicated and American ways and speech grafted on. Later came the Newsom series of elementary books for the Philippines. They were not only a little later but a little larger, thicker, heavier, and to our taste the pictures are better chosen and better in their execution and probably more numerous. This was natural, and

ought to be, if the new series had any raison d'être. It marks a distinct progress in adaptation to indigenous life.

Best of all now comes a book of Philippine Folklore Stories, by John Maurice Miller (Ginn & Co., Boston, 1904, pp. 128). There is nothing to tell us who Mr. Miller is or where he got his stories—fourteen of them, or who drew his quaint and interesting pictures, but this booklet, which bears every mark of fidelity to the inner life of the natives, will interest every student of education. It marks a very important pedagogic step in advance. Those who read these tales, especially if they look over the few anthropological collections of Philippine customs and traditions, will realize that these people have not only a soul but the germs of an indigenous culture which should be carefully searched for, gathered and utilized for pedagogic purposes. It is already plain that there is material enough for a Hiawatha-like treatment which, if it could come soon enough to contribute to these people's respect for themselves and ours for them, would help us farther on the true highway of attempting to make them good Filipinos and not cheap imitations of the average American.

These three landmarks mark the true direction of progress. Several more steps will have to be taken, perhaps, before this race can develop its own Booker Washington or before we shall have the courage to grapple with the problem that Junod is developing in the Transvaal (described in the last *Ped. Sem.*, p. 133). Here the vernacular only is permitted in the lower school grades, and the readers and the curriculum are based upon the kaffir's own folklore and the history of his tribe. Arithmetic and geography are explained in his own tongue. In this way the younger generation do not learn to despise their parents or their race; they do not forget its feudal system or their own tongue; the course of study does not stamp out the native spirit, ideals and aspirations. There are quite a number of languages to be dealt with which teachers must study and know better but there is no English allowed until well up the grades, and it is realized that the masses must always live and move and have their being in their own environment.

American Men of Science. A Biographical Directory. Edited by J. McKeen Cattell. The Science Press, New York, 1906. pp. 364.

This is a kind of biographical dictionary of over four thousand American men of science. It is a work of enormous and painstaking labor to which the Carnegie Institute made a small but very inadequate contribution at the beginning, leaving it, as it has so often done with other special researches it has initiated, to shift for itself in the end. In general the list is confined to those who have undertaken research in natural and exact science, but some administrators, engineers, physicians, teachers, have been included because they have helped to advance science or, curiously enough, it is added, if none of these, "because they are found in the membership lists of certain national societies." Blanks were sent to about ten thousand people. The bold and unique feature of this book is that the editor has affixed a star to about a thousand of these names whose work is supposed to be most important. "In each of the twelve principal sciences the names were arranged in the order of merit by ten leading students of the science. The average positions and the probable errors were then calculated so that in each science the order of merit was determined with its validity. The names were then combined in one list by interpolation, the men in each science being taken approximately proportional to the total number of workers in that science." Chemistry leads with 175; then comes physics and zoölogy, 150 each; botany and geology, 100 each; mathematics, 80; pathology, 60; astronomy and

psychology, 50; physiology, 40; anatomy, 25; anthropology, 20. "The star means that the subject of the biographical sketch is among the leading thousand students of science in the United States." Professor Cattell's object in determining the leading thousand American men of science was to secure a group for scientific study. He aims to secure data for a statistical examination of the conditions, performance, traits, etc., of a large group of men of science. One notices in looking over the work, as one sees in some university catalogues, a rather striking difference in the copiousness of the details concerning different names. Some eminent men have a few lines, and others, little known, perhaps half a column or more. The work as a whole must impress every American scholar as not only involving enormous labor and as being of great convenience, but of being, as it stands, of value and interest for every one who desires more knowledge of his contemporaries in his own and other fields.

Carnegie Institution of Washington. Year Book, No. 4, 1905. Published by the Institution, Washington, 1906. pp. 303.

These reports grow in interest, and the Carnegie Institution is to be congratulated on having at its head a very active man of science who is favorably known by his own researches and is heartily in sympathy with research. The Institution has not always had smooth sailing. One or two of the trustees, who are somewhat arbitrary and dogmatic and who are more skillful in political than they are productive in scientific work, sought, if not to control the Institution, at least to exert undue personal influence in assignments of work and to restrict the power of the president. Now, under new rules, the director is given more of the authority that he should have. The experience of the Institution so far does not seem to make any addition to its funds desirable. Its activities are far too large for the director or such a board, most of whom are perhaps the very best men who could be chosen, to direct in detail. It was inevitable that a few errors should be made in assigning the smaller funds. This and the very bigness of the Institution seems to have had a good deal to do with the new policy of rather wholesale dropping of small work and the encouragement of beginners in research and the adoption of a few large schemes which are much more easily supervised. While we have no criticism to offer for any of the great schemes, we think it deplorable and unnecessary that this magnificent Institution should have succeeded in drawing upon itself the resentment of so many of our all too few first-class men of science. The original scheme of subjecting all applications to an unknown referee in each specialty, the change of base from a policy of helping young men in our leading universities and then discriminating against them lest these institutions should become dependent upon the Carnegie Institution for help in research, the bestowal of small grants later withdrawn before the work was half finished, was unfortunate, but as we said above, some errors were perhaps most natural in launching such a great and radically new enterprise. One thing seems to us, however, unquestionable and only a dictate of obvious practical common sense, and that is that where a scientific man of mature years, of eminence, of admitted success in his work, applies for a small grant which he cannot get otherwise to help him out in a critical piece of research—such a man should not be humiliated by being turned down at the whim of some trustee who has a prejudice or because the director does not know who is who in that department. Could not this institution do something to win back the good will it has lost in some quarters by selecting perhaps not more than three or four of the most eminent men in each great department who should be assured that for the rest of their lives, if

they needed small sums to a limited amount, for use in their own personal research, they should have it for the asking, and not be scrutinized or subjected to any tests? Supposing a really good man, like the late Professor Roland, of the Johns Hopkins, proposed an investigation of a new kind in a new field. Who is competent to pronounce judgment upon his plan in advance? Moreover, why should he be required to subject it to some unknown judge, perhaps a competitor or one who might profit by his suggestions himself? Truly original research cannot be pronounced on in advance by any one and the only possible ground is the scientific character and standing of the projector. The Carnegie Institution, we fear, has much yet to learn concerning the vastest culminating problem of science and education,—namely—how to make money most effective for discovery. It seems only a truism to insist that tried, successful, elderly investigators should not be humiliated and should be dealt with not in a cavalierly but in a helpful way. We have no disposition to criticise the Carnegie Institution. Its friends and even members are candid enough themselves to admit mistakes. Any specialist can point out in their publications and in their grants bestowals that have been very wise and some that have been very injudiciously bestowed. For our own part we hope that if Mr. Carnegie intends to give more for research, it will be given not to the whole field of science, which is far too vast for any man or board, though it were as numerous as a large university faculty, to wisely superintend, but to some special department or group of sciences which can be more readily overseen. His experience must already tell him that it requires incalculably vaster wisdom to spend ten million dollars wisely than it does to acquire it. It is no criticism of the present institution to say that no one connected has any knowledge of certain departments of research. The personality is too small, and the very eminence of the director himself in his own field assures to him any great specialist's ignorance of scientific domains far from his own. We think the present fund would be productive of more good if it had been divided into two equal funds, each for some group of departments, such as *e. g.*, the humanities and the physical section. Mr. Carnegie's friends will surely urge upon him the policy of giving whatever more he may bestow by gift or bequest for the progress of science upon an independent but limited field. Along the lines above indicated there is much more to be said which some one is sure to say at greater length.

Hearings before a Sub-committee of the Committee on Naval Affairs of the House of Representatives at the United States Naval Academy, Annapolis, Maryland, on the Subject of Hazing at the Naval Academy. Government Printing Office, Washington, 1906. pp. 452.

This voluminous report of the hearings of Mr. Vreeland's committee is of considerable pedagogical interest. Hazing of very many sorts prevails, some of which are of unusually cruel and humiliating type, such as standing on the head in a tub of water, sweating, so-called rating, sitting and eating under a table, performing menial services for older classmen, and doing all kinds of stunts. The testimony of the midshipmen, many of whom appeared, shows conclusively the immense difficulties in the way of suppression, and that even the authorities, when Congress is not investigating, wink at, if they do not positively approve it. The boys cling with all the tenacity of student custom to it, and I do not notice in reading the report that one, in answer to the oft-reiterated question whether now that it is forbidden and that they are convinced it is contrary to law, expressed the opinion that it will be permanently checked.

The Child First. A State's Trust. A City's Care. A report of the Juvenile Court of Salt Lake City, Utah. Published by the Juvenile Court Commission, Salt Lake City. pp. 78.

This is an interesting report by Willis Brown, judge of the juvenile court in Salt Lake City, who has won distinction in this work second only to that of Judge Lindsey, of Denver. Beginning to a large extent with an anti-cigarette crusade, Judge Brown, with great vigor and enthusiasm that appeals to boys, has made even those whom he condemns love him. The writer of this note was privileged to visit this court for a few days and to talk with a number of the juveniles brought before it. A good part of the success is due to the great tact and sympathy of Captain M. M. Woods and Mrs. W. M. Young, the probation officers. A home has been established where the boys are very comfortable and have liberty and respect their parole, and another important point is that the newspapers have agreed to keep out of the sessions of the court, so that no publicity is given to the names of those brought before it. If a minor is found drunk or has purchased a pistol, every effort is made to find out from whom they were bought and he is immediately summoned to court and either bound over or committed or warned as the case may be. The young culprit, if a small boy, is perhaps taken on the judge's knee and told to tell all about it. His parents are present and the interests of the child are studied. The majority are let off the first few times with only a reprimand.

Boyville. A History of Fifteen Years' Work Among Newsboys. By JOHN E. GUNCKEL. Published by The Toledo Newsboys' Association, Toledo, Ohio, 1905. pp. 219.

This is a record of personal experience and, perhaps, ought to be called notes by the way. The pledge and certificate is that the boy member "does not approve of swearing, lying, stealing, gambling, drinking intoxicating liquors or smoking cigarettes. There are many pathetic and heroic incidents recorded. As an illustration of the author's liberality and common sense, he tells a story of a boy reproved for swearing who replied that both his parents swore and insisted that he could swear all he wished. Gunckel had him rehearse the seven big swear words he knew, told the boy to go home and when his parents wanted something to try these swear words on them until they revoked their permission for him to use them. He tried the experiment, was soundly thrashed and sent back to take out a card and pledge. The boys are told that if they are in the habit of swearing they will often do it before they think but must not be worried, but experiment with themselves for a month before they sign any pledge.

Der Bau des Fixsternsystems mit besonderer Berücksichtigung der Photometrischen Resultate. Von HERMANN KOBOLD. Die Wissenchaft. Sammlung Naturwissenschaftlicher und mathematischer Monographien. Heft 11. Friedrich Vieweg und Sohn, Brunschweig, 1906. pp. 256.

The writer discusses at great length the formation of our stellar universe and concludes as follows: that together with gaseous nebulæ of very low temperature there are also bodies in a state of great condensation and of glowing heat. The order of these masses is neither uniform nor without rule, but they are crowded together in masses around certain centres of concentration. Here they are rather loosely connected with each other and arranged in the form of a great many-armed spiral. In the remoter parts of these spirals are found the hot and the gaseous stars, while those nearer the sun, which is usually not far from the centre of the spiral, are in their physical state more or less

like it. Our sun is in a point of the milky way, the motions being in the chief plane of the whole spiral, a great number of the stars near by taking part in this motion. Among the stars are many groups with apparently common movement toward points of the milky way. The stars of each group are in one plane and their true movement, concerning the true character of which we are not yet well informed, occurs in this plane.

The Launching of a University and other Papers. A Sheaf of Remembrances. By DANIEL COIT GILMAN. Dodd, Mead & Co., New York, 1906. pp. 386.

Some years ago Dr. Gilman published an interesting volume of addresses entitled "University Problems." He now prints twenty-two more, nine of which are intimately connected with the history of the Johns Hopkins University, and which will constitute very important data for the future historian of that institution and of education in this country. The remainder are addresses on various occasions. No university president in this country has shown such sympathetic appreciation of both the educational value of science and of the methods of research and investigation. Happily the work and the story of President Gilman's life has become pretty familiar among educators of our country, but this volume is an addition of very great value.

A New Interpretation of Herbart's Psychology and Educational Theory through the Philosophy of Leibniz, by JOHN DAVIDSON. Wm. Blackwood & Sons, Edinburgh, 1906. pp. 191.

The key of Herbart, this author finds in Leibniz. His reals are like Leibniz monads, and the theory of feeling and will, desire and interest are found, at least in germ, in Leibniz. Although this work is by a well-known educator the writer has had a good philosophical training and the book will be quite as important, if not, indeed, more so, for the student of philosophy as for the teacher.

The Principles of Teaching based on Psychology, by EDWARD L. THORNDIKE. A. G. Seiler, New York, 1906. pp. 293.

The author's aim in this book is to make the study of teaching scientific and practical. The title of the chapters will give an idea of its scope. They are Physical Education; Instincts and Capacities; Apperception; Interests; Individual Differences; Attention; Association; Analysis; Reason; Conduct and Morals; Responses of Feelings; Motor Expression and Education; Formal Discipline, the Scientific Study of Teaching.

The School Arts Book, edited by Henry Turner Bailey. Vol. 4, Sept., 1904, June, 1905. The Davis Press, Worcester, Mass., pp. 701.

Mr. H. T. Bailey is one of the most progressive and enterprising teachers of art in this country. He loves beauty and loves the child, long since made a complete break from the old Prang system, and attempts in this series to gather up all the important and available elements that go to make up what a drawing teacher should know. He is sometimes criticised as not being entirely systematic but he is far better: he is all-sidedly suggestive and stimulating and that to a high degree.

Das Zukunftsprogramm unserer Schulgesetzgebung, von FRANZ J. VON ROTTENBURG. Carl Georgi, Bonn, 1906. pp. 67.

The writer believes that we have not yet solved the question of moral and especially that of religious education. Before we can do

so, he holds that we must have a general consensus concerning fundamentals by the different confessions, that we must take note of the lessons that come from the development of the religious consciousness of the race, that we must avoid dogma and appeal to the *Gemüth*, that in this way it is now possible to work out a course which will be very efficient in checking developments of immorality and irreligion in our schools.

L'Augmentation du Rendement de la Machine Humaine, par L. QUERTON. Instituts Solvay. Misch & Thron, 1905. pp. 216.

The writer discusses the influence of the environment on the development of man before school age, including such topics as pregnancy, birth, milk supply and sewage. During the scholastic period the topics treated are general education and the injurious and helpful factors in it. The third part deals with labor of adults, legislation, scale of pay, hours of work, professional hygiene, inspection, etc.

Méchanisme et Education des Mouvements, par GEORGES DEMENY. Felix Alcan, Paris, 1905. pp. 523.

We have here an elaborate and essentially new book, illustrated with nearly six hundred cuts and diagrams, which attempts to represent the graphological idea as carried out by Marrey. Beginning with the account of muscles and the skeleton, the author proceeds to analyze the movements of the different joints, the attitudes, educational movements, etc. Locomotion is studied with the kinematograph and dynamometer and we are told that it is often necessary to reconstruct habits of movements that are wasteful of energy. The mechanism of running and hopping have a chapter by themselves. Other sections or chapters are on walking on the hands, hanging and swinging, and finally the economic movements in marching, in dress parade, normal rhythm, etc., are dwelt upon.

Religionsgeschichtliche Volksbücher für die deutsche christliche Gegenwart. Herausgegeben von FRIEDRICH MICHAEL SCHIELE. Gebauer-Schwetschke, Halle a. Saale. I. Reihe, ⅔ Heft, 1904: *Jesus*, von W. BUFFET. pp. 103. V. Reihe, 1 Heft, 1905: *Welches ist die beste Religion?* von FRIEDRICH NIEBERGALL. pp. 76. V. Reihe, 2 Heft, 1905; *Die Wunder im neuen Testament.* pp. 72.

The five series of which these little volumes are examples represent an attempt to put in brief and popular form the results of scholarship in various departments of religious study. They are generally written by experts and together constitute a line of effort which has no parallel in English. Every trace of denominationalism is weeded out, and while the results of the higher criticism are apparent to those who can discern, so that there is nothing that can offend the intelligent and even scholarly reader, much stress is laid upon edification. The work, indeed, goes far to show that even if all the negative results in this field are accepted, there remains ample ground for edification.

Die Elemente der Erziehungs und Unterrichtslehre, von PAUL BARTH. Johann Ambrosius Barth, Leipzig, 1906. pp. 515.

Here we have another of the philosophical and psychological treatises on pedagogy so characteristic of Germany, although this time by a university professor. It begins with the usual Begriff, Ziel, etc., of education, and then takes up the education of the will, feelings, perception, attention, memory, judgment, the curriculum, etc. In the next part special topics are considered—religion, morals, history, etc.—to hand work. The method of the writer is to present under each

topic a brief summary of the history of the methods of teaching the subject down to the present and it ends with some characterization of the more important recent, perhaps experimental, literature bearing upon the subject. It is far better than anything of the kind we have in English. One sees at a glance that the author has availed himself of most of the special sources on the different topics of which he treats. He is not unsympathetic to even Lay's experimental didactics.

Annual Report of the Board of Regents of the Smithsonian Institution, showing the Operations, Expenditures and Condition of the Institution for the year ending June 30, 1904. Report of the U. S. National Museum. Government Printing Office, Washington, 1906. pp. 780.

The main body of this interesting report is given to the history of American geology. It abounds with copious illustrations both of men and of their finds and has some brief discussion of a few present questions of interest in the field.

American History in Literature. Compiled by Martha A. L. Lane and Mabel Hill. Ginn & Co., Boston, 1905. pp. 178.

This attractive little booklet contains some seventy extracts, mostly from prominent authors from 1607 to the present time, illustrating important historic themes concerning the new world, new aims, colonial life, Revolution, the Union, the keeping of it, the Civil War, and the growth of the nation.

Laboratory Astronomy, by ROBERT W. WILLSON. Ginn & Co., Boston, 1905. pp. 189.

This is an interesting primer of technique and implies and seeks to develop a conception of fundamental facts and to help the student over initial difficulties. One interesting pedagogic feature of the book is that much of it can be worked with very simple apparatus. While primarily for teachers, it is also suitable for a text-book, although it is somewhat condensed. It is a valuable addition to the pedagogical literature of the subject.

A Course in Vertebrate Zoölogy. A guide to the Dissection and Comparative Study of Vertebrate Animals. By HENRY S. PRATT. Ginn & Co., Boston, 1905. pp. 299.

This supplements the author's Invertebrate Zoölogy, published some years ago. It is a guide to dissection of the important groups of vertebrates, each dissection complete in itself. The writer seeks to keep the morphological relations of various groups in mind. He usually selects a single individual as illustrative of its group, so that the book is essentially about the following animals: the dog, fish, perch, necturus, frog, turtle, pigeon and cat.

First Science Book. Physics and Chemistry. By LOTHROP D. HIGGINS. Ginn & Co., Boston, 1905. pp. 237.

This new introduction to science study has the merit of being a course in common phenomena. It is designed to precede the more systematic knowledge of the preparatory school and is based on experience. The illustrations are simple and well chosen and the style is clear and well adjusted to children. Beginning with matter, and energy, it treats of fluids, pressure, motion and force, heat, sound, light, electricity, gives an outline of chemical study and of common substances and processes.

The Palmer Cox Brownie Primer, arranged from Palmer Cox's Brownie Books, by MARY C. JUDD. Pictures by Palmer Cox. Grading and editing by Montrose J. Moses. The Century Co., New York, 1906. pp. 108.

This book is unique in that the illustrations, several on a page, are all of brownie life. Brownies stand for the numbers, they are going to school, lifting over the leaf of a book, robbing apples, dancing, sailing, walking on a tight rope, tumbling over an elephant, playing games, sawing wood, crowded in a sleigh, on a fence, in trees, on stepladders, riding on clouds, singing, flying around a windmill, etc.

Plant Breeding. Being Six Lectures upon the Amelioration of Domestic Plants. By L. H. BAILEY. 4th edition. The Macmillan Co., New York, 1906. pp. 483.

This eminent scientist has here attempted to make the garden interesting, describing the evolution of forms of plant life found in it, and seeking to interest teachers of horticulture as well as botany. The first lecture describes the fact and philosophy of variation; the second, crossing; the third tells how domestic varieties originate; the fourth summarizes recent investigations; the fifth describes current plant breeding practice; and the last lecture is on pollination or how to cross plants.

Congress of Arts and Science. Universal Exposition, St. Louis, 1904. Edited by Howard J. Rogers. Vol. I. History of the Congress, by the Editor. Scientific plan of the Congress, by Professor Hugo Münsterberg. Philosophy and Mathematics. Houghton, Mifflin & Co., Boston, 1905. pp. 626. Vol. II. History of Politics and Economics. History of Law. History of Religion. 1906. pp. 661. Vol. III. History of Language. History of Literature. History of Art. 1906. pp. 680.

The authorities of the great international congress at St. Louis have advanced so far toward the fulfillment of their promise to print all the important papers in whole or in abstract given at this great congress. The delay in starting had led some to doubt whether these proceedings would ever see the light, and it is to be feared that as it is their sale will hardly be remunerative and that the publication will lead to still further loss on the part of the authorities of the exposition. Some of these papers were nothing less than epoch-making and we think there can be no question but that in their published form they will do even more to stimulate American learning than would the congress itself have done had the proceedings not been printed.

Pestalozzi and His Educational System, by HENRY BARNARD. C. W. Bardeen, Syracuse, N. Y., pp. 751.

As early as 1860 Dr. Henry Barnard published a book on Pestalozzi, and in his famous journal from time to time added more. Here all these publications are printed in one volume which is of great value to, and ought to be in the hands of, every student of education. While we might wish that the copious literary references it contains were not so antiquated but were brought down to the present time, we welcome, nevertheless, the commendable effort to reprint from the famous plates these extremely illuminating but somewhat scattered articles on the great Swiss pioneer.

Studies in English Syntax, by C. ALPHONSO SMITH. Ginn & Co., Boston, 1906. pp. 92.

The larger purpose of these essays is to instruct the reader in the

structure of the English language, to show him the wide reach of syntactical problems and to discover and interpret by a scrutiny of all periods of language some of the natural laws that underlie its architecture. The author is one of the most successful and effective teachers of English language and literature in the South, where natural studies in English are better developed than in the northern colleges and universities.

Cloud Studies, by ARTHUR W. CLAYDEN. John Murray, London, 1905. pp. 184.

This charming book contains 61 full-page cloud photographs, the taking of which involves the overcoming of a number of rather grave technical difficulties. The author, in general, adopts the international system of cloud nomenclature; viz., (a) upper clouds, cirrus and cirro-stratus; (b) intermediate clouds, cirro-cumulus and alto-cumulus and alto-stratus; (c) lower clouds, strato-cumulus, nimbus; (d) clouds of diurnal ascending currents, cumulus and cumulo-nimbus; (e) high fogs, stratus.

La Lutte contre la Dégénérescence en Angleterre, par M. BOULENGER and N. ENSCH. Hygiène Scolaire. Instituts Solvay. Misch & Thron, Leipzig, 1995. pp. 97.

This little volume in an interesting series treats of the congress of Glasgow, medical inspection of schools, food for infants and various asylums for them.

West Africa, von MORITZ SCHANZ. Wilhelm Süsserott, Berlin, 1905. pp. 415.

In a previous volume the author had described briefly the history, mode of government and present status of all the African colonies on the east and south of that vast continent. He here supplements that volume by another in which he treats in the same way the colonies of the west coast. These include possessions of Portugal, Spain, France, England, Belgium and Holland.

Readings in European History, by JAMES HARVEY ROBINSON. Abridged edition. Ginn & Co., Boston, 1906. pp. 573.

This is a collection of extracts from the sources chosen, with the purpose of illustrating the progress of culture in western Europe since the German Invasions. The extracts begin with Seneca and Epictetus and end with a quotation from Hobson's lecture on imperialism. The range of topics is wide, including science, pure and applied, politics and social democracy and the Europe of to-day.

The False Entry and Other Stories, by C. W. BARDEEN. Syracuse, N. Y., 1905. pp. 244.

The author has here given us five new stories of teachers, illustrating school strivings, defeats, dishonesties, pretence, the good and bad qualities, and motives of a teacher's life.

Report of the Committee on Industrial Education in Schools for Rural Communities to the National Council of Education, July, 1905. pp. 97.

Report of the Committee on Taxation as Related to Public Education to the National Council of Education, July, 1905. pp. 87.

Report of the Committee on Salaries, Tenure, and Pensions of Public School Teachers in the United States to the National Council of Education, July, 1905. pp. 466. Published by the National Education Association, 1905.

Studies in the Scriptures. Series I. The Plan of the Ages. Bible and Tract Society, Allegheny, Pa., 1905. pp. 356+14.

Deutsche Liebe aus den Papieren eines Fremblings, von MAX MÜLLER. Edited by James Chapman Johnston. Ginn & Co., Boston, 1905. pp. 185.

Four German Comedies. Edited with notes, repetitional exercises and vocabulary, by Edward Manley and Philip Schuyler Allen. Ginn & Co., Boston, 1905. pp. 210.

Elementary Algebra, by C. A. WENTWORTH. Ginn & Co., Boston, 1906. pp. 421.

Greek Sculpture, Its Spirit and Principles, by EDMUND VON MACH. Ginn & Co., Boston, 1903. pp. 357. 40 plates.

Essays of Elia. First series. By CHARLES LAMB. Selected and edited with introduction and notes by Geo. Armstrong Wauchope. Ginn & Co., Boston, 1905. pp. 302.

Elementary French Composition, by JULES LAZARE. Ginn & Co., Boston. pp. 134.

A Series of French Readers, compiled by Jules Lazare. Ginn & Co., Boston. Lectures faciles pour les commencants, pp. 89. Premières lectures en prose et en vers; A new French Reader for elementary and intermediate classes. New edition, revised and enlarged. pp. 132. Contes et nouvelles des meilleurs auteurs contemporains. First series. pp. 132. Contes et nouvelles des meilleurs auteurs contemporains. Second series. p. 159.

A Student's Manual of a Laboratory Course in Physical Measurements, by WALLACE C. SABINE. Ginn & Co., Boston, 1906. pp. 97.

First Science Book. Physics and Chemistry. By LOTHROP D. HIGGINS. Ginn & Co., Boston. pp. 237.

Transactions and Proceedings of the National Association of State Universities of the United States of America. 1904. pp. 118.

Sesame and Lilies, by JOHN RUSKIN. With introduction and notes by Mrs. Lois G. Hufford. Ginn & Co., Boston, 1905. pp. 107.

DeQuincey's The English Mail Coach and Joan of Arc. Edited with introduction and notes by Milton Haight Turk. Ginn & Co., Boston. pp. 121.

L'Été de la Saint-Martin, par MEILHAC et HALÉVY. *La Lettre Chargée*, par EUGÈNE LABICHE. *Vent d'Ouest*, par ERNEST D'HERVILLY. With notes, vocabulary and exercises by Roy Temple House. Ginn & Co., Boston, 1905. pp. 137.

Intermediate French. Translation and Composition. Selected and arranged by Louis Curtis Jaques. Ginn & Co., Boston, 1906. pp. 139.

NOTE.

We have before us the programme for the first Congress for Child Study and for the Care of Youth, which is to be held early next October in Berlin, under the guidance of W. Münch, J. Trüper, W. Ament, Baginsky, Heubner, Rein, Ziehen and others. The committee, headed by Professor Münch, 22 Luitpold Strasse, Berlin, will be ready until March to receive propositions from any and all who desire to present papers. Although it is essentially a German congress, the participation of guests from other lands is hoped for. The plan is a broad and timely one and it is hoped that America will have a good representation here.

NOTE.

In Milwaukee a system of utilizing the Museum for public school instruction, which is worthy of notice, has been established. For some years public school classes had been taken taken to visit the museum but this was found to waste so much time and energy on the part of both teachers and pupils that in 1900 the present system, which has now passed the stage of experiment, was instituted by the Superintendent of Schools, H. O. Siefert. An arrangement was made with the museum directors by which a room was set apart for the use of public school classes and a museum lecturer, whose salary was paid by the school board, was appointed. A schedule was arranged by which every class above the third grade was assigned a definite day and hour during the year for a museum visit. Cases were provided in the schoolroom to which all objects not too large could be removed from the permanent cases for purposes of demonstration, the classes being conducted through the museum to see objects too large for removal. As the Milwaukee Museum is chiefly devoted to Natural History, the range of subjects is somewhat limited, but the museum visits have proved a valuable aid to nature study, physiology, geography and United States history. In physiology the skeletons have been used to give the children an idea of comparative anatomy and an unexpected amount of interest has been aroused. History has been made interesting through demonstration of the Indian relics and collections of utensils illustrating colonial life. As the museum has practically no exhibit for colonial life, various patriotic societies, especially the Daughters of the Revolution, have loaned many articles and have fitted up a part of the schoolroom to show the interior of a New England kitchen. Here the processes of spinning and weaving and the use fo the various utensils are actually shown and this department, which, at first, appeared least promising, has become one of the most interesting. The geographical lectures are, by the limitations imposed by the collections, restricted chiefly to anthropology and animals but there has been a marked increase of interest in these subjects and an increased call at the library for books on the countries studied.

Children from the schools for the blind and deaf have been given instruction and, in some cases, the adult blind have been invited to attend these lectures. A detailed account of this work, by Miss Merrill, the museum lecturer, may be found in the forthcoming number of Educational Work.

THEODATE L. SMITH.

NOTE ON PROGRESS IN CHILD STUDY IN EUROPEAN COUNTRIES.

Italy. From Italy comes, through Prof. Maestrini, a most encouraging report of progress and growing interest in child study among Italian educators. In an article entitled "Milestones" Prof. Maestrini notes the following events which have led up to development of genetic psychology in Italy. In 1871 Paola Mantegazza, the well known naturalist, psychologist and physiologist, founded in Florence the Society of Anthropology and Ethnology. This marked an epoch in the study of man in the broader sense, for it emphasized the need of the study of mankind in all his aspects, anatomical, physiological, psychological and social, in all climes and at all ages, and roused an interest in the study of children from a scientific point of view. In 1897 C. Melzi founded at Arona a Cabinet of pedagogical anthropology and, although two years later he was obliged to give up the work, its influence inspired others and later bore fruit in the work of Dr. Bari-Bruno, Marimò, Cabrini and Pastorello, all of whom opened small cabinets of anthropology, and in the studies of children, especially those of school age, carried out by Anfosso, Garbini, Guidi, Ferriani, Lombroso and Mosso. In the university, interest in child study has been diffused through Sergi, Ardigò, De Dominici and Fornelli.

In 1899 Dr. Ugo Pizzoli, after a work of preparation and organization occupying many years, founded his Laboratory of Experimental Pedagogy at Milan. This has been successful beyond expectation and in 1902, for the first time, the teachers of Italy were invited to attend a course of pedagogical lectures at Crevalcore. One hundred teachers from different parts of Italy were present, and through them the influence of the new methods, based on the study of the child, was spread throughout Italy, giving new life and interest to the schools.

In December, 1895, Prof. Vecchia inaugurated at the Sapienza di Roma a series of conferences on the Psychology of Childhood, to be held three times a week during the academic year. The purpose of this course was, to quote Prof. Vecchia's words, "to render less arduous some of the difficulties, and less easy some of the mistakes in the study and education of children."

The last year has greatly increased the list of Italian Educators enrolled as members of the Society for International Co-operation in Child Study and the University has received through Prof. Maestrini some valuable material collected from Italian sources. Among the names received at the University are included elementary and normal school directors, professors, doctors, teachers in all grades of schools, and specialists in the schools for deaf-mutes and for defective children, showing that the interest is wide-spread and that the importance of child study as fundamental to educational work of all grades is recognized.

Poland. Madame Grudzinska, of Poland, reports that in spite of political troubles, which have of necessity hindered progress, a child study association has this year been founded at Warsaw and that active work is being done. Madame Grudzinska has by personal effort collected and translated into English much valuable material for Clark University.

Austria Hungary. Letters have also been received from Dr. Kazimier Lutoslawski, of Zakopane, Austria Hungary, who is about to establish next year, in Poland, a school founded on child study lines. Though the unsettled state of affairs in Russia has prevented organized work, the work done in other countries is translated and read with interest, and excellent work is being done by individuals.

THEODATE L. SMITH.

BUTTRESS,

AS DEFINED BY SEVENTH GRADE PUPILS.

Butress—to intrude: Butrus—to button: Buttruce—rude in manner: Buttress—one who makes patterns: Buttriss—one who works in a buttry: Butress—a lady servant: Butress—one who butts: Buttress—one who buttons dresses: Buttress—a woman hired to wait on table: Buttress— to butt: Butress—a lady who does work similar to a buttler: Buttress—a sort of battling ram: Butteruss—buttonless: Buttressh—part of stairs: Buttress—one who puts on buttons: Buttress— one who interferes: Buttrus—the child is buttrus.